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THE Tech Magazine

THE MAGAZINE OF THE IST

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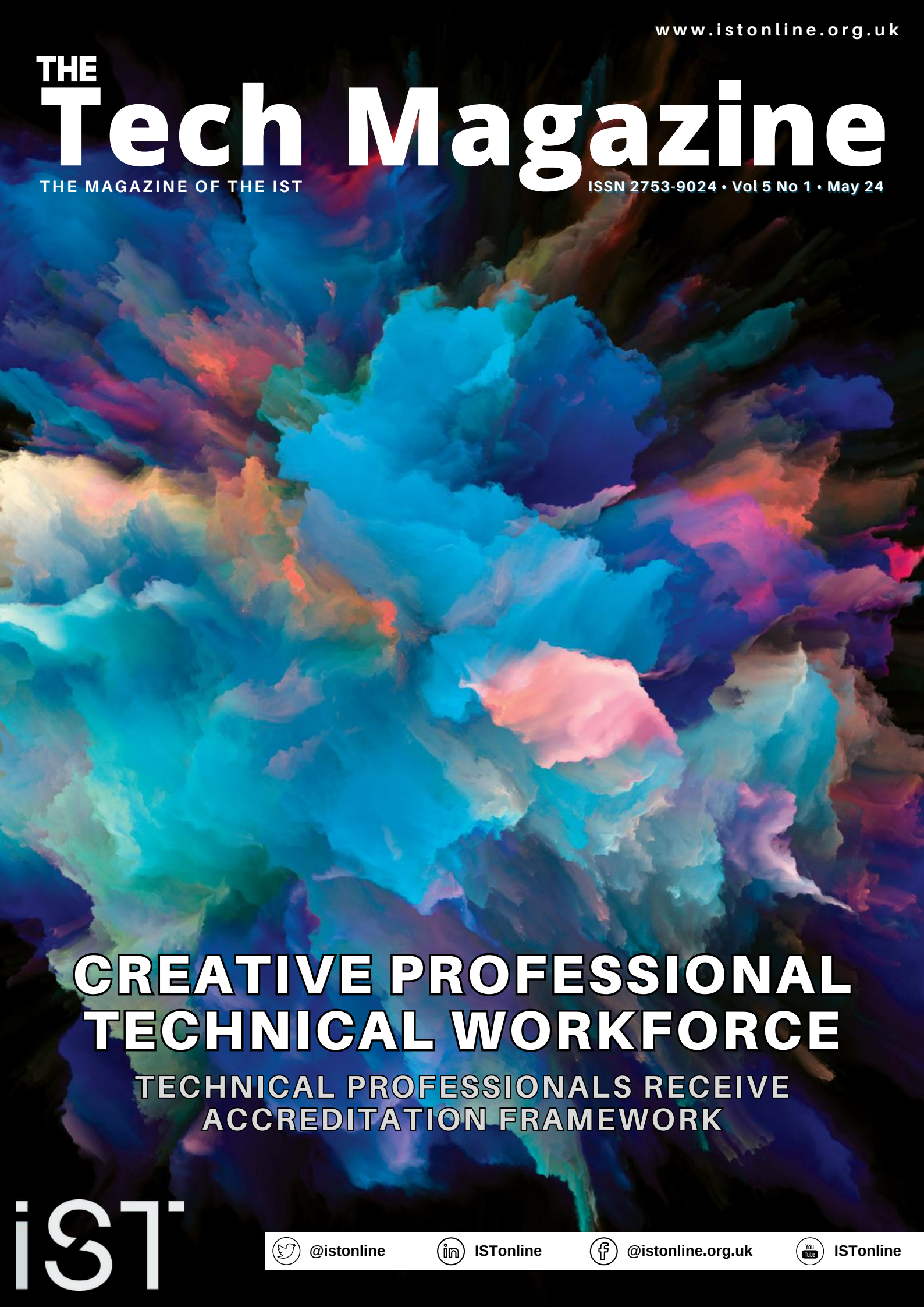

CREATIVE PROFESSIONAL TECHNICAL WORKFORCE

TECHNICAL PROFESSIONALS RECEIVE ACCREDITATION FRAMEWORK

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THE Tech Magazine

The magazine for, and made by, the technical community.

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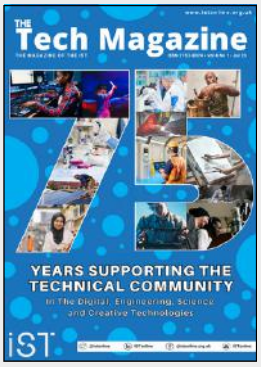
PUBLICATIONS: The Journal | The Tech Magazine | The Bulletin



The IST **eNewsletter** has evolved in both design and substance, transitioning from a conventional newsletter to a recognised magazine over the past seven years. We are grateful for all the uplifting feedback we've received. The content has resonated well, showcasing the diverse technical workforce across various sectors. With the ambition to elevate this initiative, we've transformed it into **The Tech Magazine**. This move is designed to empower technicians with a platform for their contributions and to ensure the technical community is accurately depicted. Our goal is to continually refine our publications to support your professional and career development. We welcome any feedback or thoughts you may wish to share.

IST members can contribute with articles of interest / opinion pieces or research and information blogs. Members can advertise their projects, awards, or even advertise or offer an advert for their organisation. Below are some of the contents topics in our magazines:

MAGAZINE WALL OF CONTENTS

UPDATES & NEWS | INDUSTRY | BUSINESS

RESEARCH INSTITUTES | CONSULTANCY

COLLEGES | HIGHER EDUCATION | SCHOOLS

#TECHNICIANJOURNEY | AWARDS

E-ARTICLES | CREATIVE | ENGINEERING

SUSTAINABILITY | DIGITAL | SCIENCE

OUTREACH | ENGAGEMENT | DEI

TRAINING & RESOURCES | CPD CORNER

EVENTS | ARCHIVE | CROSSWORD

THE TECHNICAL COMMUNITY

Giving technicians the visibility & recognition they deserve

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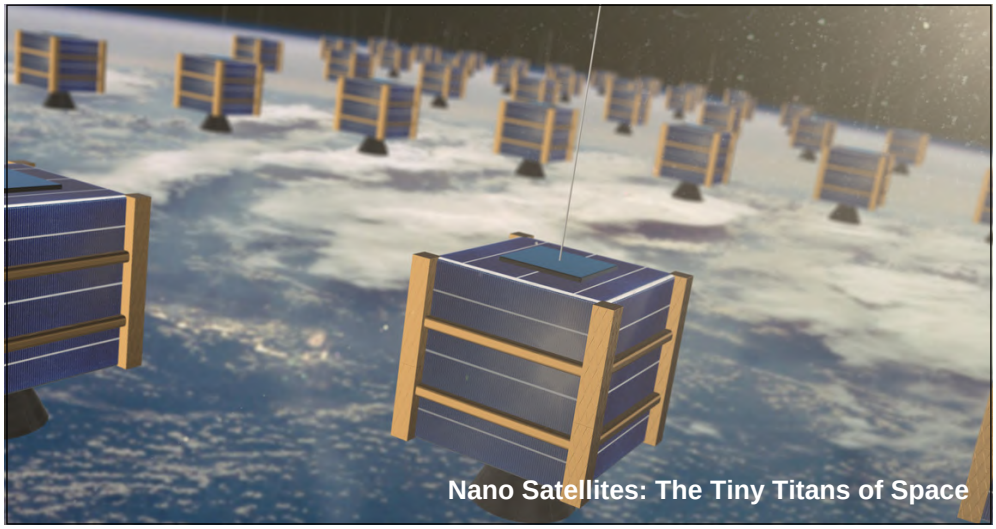

WELCOME TO YOUR MEMBERSHIP MAGAZINE

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Volume 5 Number 1
May 2024

This magazine is made for, and made by, the technical community.

CALL TO MEMBERS:
If you would like to publish an article or are interested in joining the team, contact us at the office, we would love to hear from you.

For details contact
office@istonline.org.uk

Advertising in The Tech Magazine is given to our members free of charge. We have advertising offers available to non-members and anyone interested.

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The Tech Magazine is produced on behalf of the Institute by AI Group.

Views expressed in this magazine are not necessarily those of the Editorial Board or the Institute.

Cover image: 'Creative Technicians'.

Thank you for everyones contribution to this edition of the magazine.

We would love to hear your views on the Magazine and learn more about what you would like us to include in the future. Please feel free to send us your thoughts via office@istonline.org.uk.

Welcome

CHAIR'S MESSAGE

Terry Croft MBE, CSci FIScT
IST Chair

"The IST is run by technicians for technicians so, join one of our teams and play your part. Contact: office@istonline.org.uk"

Welcome to the latest edition of The Tech Magazine, the technical publication of the Institute of Science and Technology. As we navigate through the ever-evolving landscape of technology and innovation, and with a new Government on the verge of inception, our mission remains steadfast: to support the professional technical workforce working across all sectors.

The dedicated volunteers at IST have been actively engaging on your behalf, conducting workshops, participating in and backing numerous pivotal technical conferences and events, both virtually and face-to-face. They have been attentively hearing out our members and the broader technical community. This engagement positions us to offer multifaceted support to our members and the community by staying abreast of the developments and happenings that influence you, affecting your professional life, career trajectory, and the evolution of the many technical job roles. We owe immense gratitude to all our volunteers, those who are with us today and those who have served in the past.

These exceptional volunteers form the core of the IST. Their dedication to voicing the interests of our community is unwavering, ensuring that your concerns are acknowledged at both local and national levels. Their commitment is evident as they devote their time to various roles and support functions within IST, all of which enrich the membership experience.

Terry Croft and Anthony Roberts with London South Bank University (LSBU) students at IST Conference 2023.

In this issue, we delve into the breakthroughs that are shaping our future. From the quantum leaps in artificial intelligence to the sustainable solutions revolutionising our environmental impact, each article is a testament to the ingenuity and perseverance of the technical workforce both in the UK and further afield.

As Chair, I am continually inspired by the collaborative spirit that drives our institute. We are at the cusp of a new era, where technology transcends boundaries and creates a global dialogue of progress. The Tech Magazine is more than just a publication; it is a platform for technicians from early career individuals to advanced practitioners to share their work, ideas or thoughts. I encourage all of our members to contribute to future publications.

In this edition, you can read about sustainability in innovation, the AI trends and its impact, space exploration and technology as well as cybersecurity trends and safeguarding our digital future. We are also very proud to have launched both of our new professional registers, for AI and Creative practitioners, and I would strongly encourage both our members and non-members to look into gaining the accreditation and recognition they deserve. Information about the two professional frameworks can be found at our website.

I look forward to seeing you all in September at this year's annual conference and please feel free to stop me or my colleagues for a chat or to highlight any concerns you may wish to raise.

With best wishes,

Terry.

Editor’s Welcome

I’m thrilled to introduce the first of this year’s volumes of The Tech Magazine. As the new editor, I’m honoured to take the reins from Joan Ward, who has skilfully guided our publications as acting Editor for the past few years. It’s with great joy that I welcome you to explore a realm filled with cutting-edge trends, insights from our members, and highlights of the remarkable technical workforce.

Ian Moulson FIScT, the previous Editor and IST Marketing Officer, did an exceptional job in delivering the Journal to the IST community before he stepped down. I am committed to continuing this effort with dedication, by re-envisioning both past and current publications, including the Bulletin, to serve you just as well. The Tech Magazine has evolved from its origins as an E-Newsletter into the robust platform for communication it is now, thanks to the attentiveness of our members’ wishes and the incredible capabilities of the IST team.

I would like to extend my sincere thanks to all those who have provided articles and advertisements. We hope you will find the material engaging, and we’re open to suggestions if there are specific subjects you are interested in. Additionally, my heartfelt thanks go to the Editorial Board for their pivotal role in offering feedback and verifying that the content serves the technical community’s needs effectively.

In this edition, we’ve curated a collection of articles and news contents that are as diverse as they are informative. From technology in artificial intelligence to the serene realms of art and creativity, we hope you enjoy the contents.

In our E-articles section, we explore the convergence of AI and sustainability, discover the trends, ethics and impact of artificial intelligence, as well as an insight into the new era of space technology and exploration. We also delve into the impact that Creative UK have made in the creative industries, which through this collaboration has culminated in the launch of a novel professional accreditation framework for the creative technical workforce.

Those passionate about networking can read about the AI Group’s recent developments, which covers the debut of the innovative AI accreditation framework and news from the Women in Tech Group, including details on the forthcoming seminar. Additionally, Dr Alicia Coulson delves into ChatGPT and indigenous sovereignty in her insightful piece.

This volume also includes updates from our members and sector news, along with further information about this year’s Conference at Lancaster University, known as ‘the Gateway to the Lake District’. We look forward to seeing you on the 10th of September. We also invite those interested in a more hands-on role to join our amazing team of volunteers, whose dedication and expertise are the driving forces behind the conference’s continued success each year.

As always, we encourage you to engage with our content, to question, to reflect, and to contribute. It’s common for technical staff we encounter through the IST to underestimate their worth and doubt their ability to contribute to the Magazine. We firmly disagree with this sentiment. Our aim is for the Magazine to be open and welcoming to every one of our members and the wider technical community. The Tech Magazine is crucial in providing those just beginning their careers with an opportunity to break into the world of publishing.

We hope you enjoy this edition of the magazine.

Warmest Regards,

J.P. AK

JP Ashton-Kinlin, RSci FIScT
Editor / IST Marketing and Development Officer

“The Tech Magazine is crucial in providing those just beginning their careers with an opportunity to break into the world of publishing.”

GONE ARE THE DAYS OF ‘I’M JUST A TECHNICIAN’

TECHNICIANS ARE AWESOME AND PLAY KEY ROLES IN ALL AREAS OF THE ECONOMY

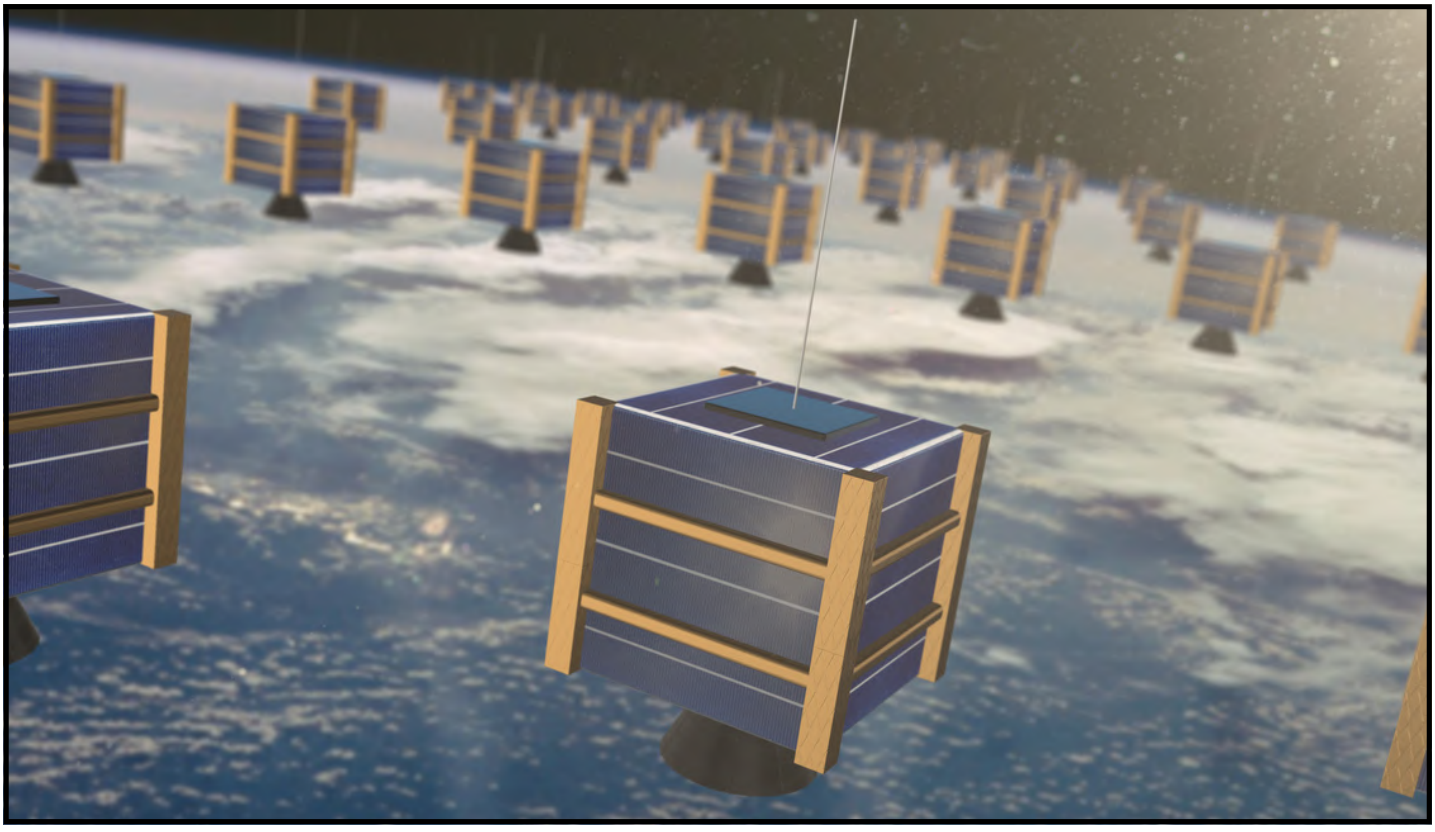
Space Technology: A New Era of Exploration & Innovation

Alex Rutherford

There has already been a watershed moment for space technology early on in this year, characterised by ground-breaking advancements that have propelled our exploratory prowess beyond the confines of Earth's atmosphere. This year has seen a surge in innovation, with the deployment of nano satellites, known as Tiny Titans, which have revolutionised our approach to space exploration. These compact yet powerful devices have swarmed low-Earth orbit, enabling high-resolution Earth observation and global communication networks, and even opening the possibility of asteroid mining.

In addition to these miniature marvels, there has been a significant push in advanced space manufacturing. The unique conditions of space have proven ideal for the production and testing of a wide array of materials and products. From ultra-pure pharmaceuticals to high-performance materials and advanced electronics, the potential for manufacturing in the microgravity environment of space has begun to be tapped. This trend is expected to continue throughout the year, with several projects aligning with this innovative trajectory.

Furthermore, the satellite sector has witnessed substantial advancements, driven by industry giants such as SpaceX, OneWeb, and Amazon's Project Kuiper. The expansion of satellite constellations with thousands of new and enhanced small satellites is set to deliver next-generation global broadband coverage. Alongside these developments, the integration of quantum communication technology and the use of AI in satellite operations have marked a



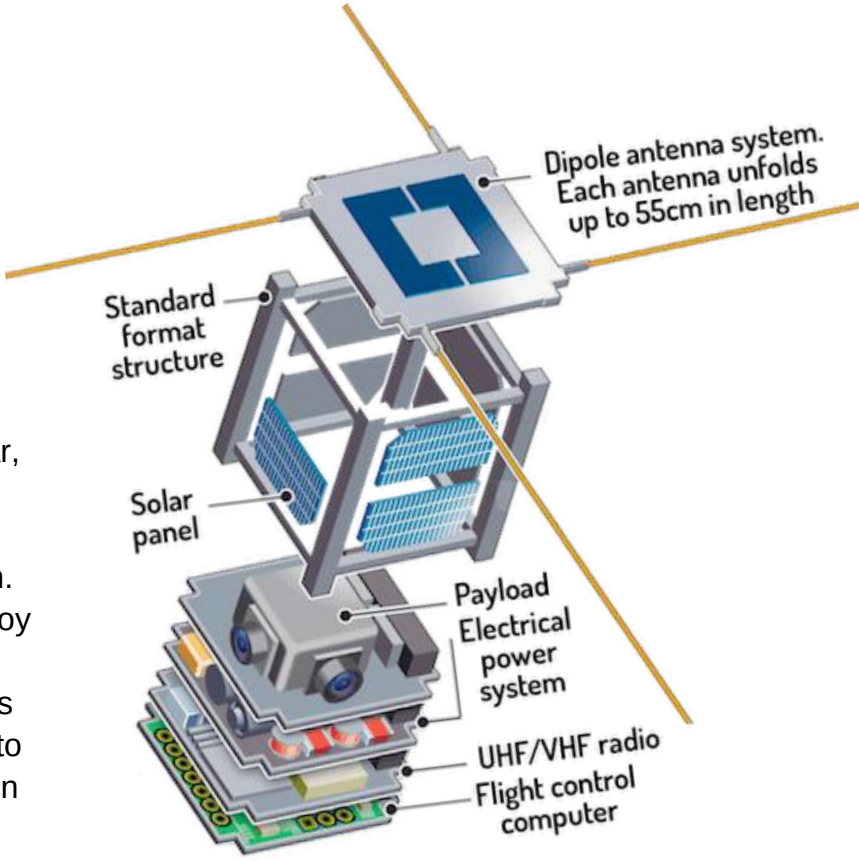
new era in space management and control systems. These trends and technologies are not just reshaping our current capabilities but are laying the groundwork for the future of space exploration and its boundless possibilities.

Nano Satellites: The Tiny Titans of Space

One of the most notable trends so far this year, has been the rise of nano satellites. These miniature wonders, often referred to as “Tiny Titans,” have revolutionised space exploration. They are lighter, cheaper, and quicker to deploy than traditional satellites, making space more accessible than ever before. Their applications range from high-resolution Earth observation to global communication networks, and they even hold the potential for asteroid mining.

Asteroid mining is the theoretical concept of extracting valuable resources from asteroids and other minor planets, including those near Earth. It involves several challenges, such as the difficulty in identifying suitable asteroids for mining, and the technical complexities of extracting usable materials in the harsh environment of space. The idea of asteroid mining has been around for decades, initially appearing in science fiction before becoming a subject of serious academic and commercial interest. The potential rewards of asteroid mining are significant, as asteroids can contain precious metals like platinum, gold, and rare earth elements, as well as water, which could be used for life support and fuel in space missions.

Despite the promise, as of 2023, less than 7 grams of asteroid material has been successfully returned to Earth. However, ongoing and future missions aim to increase this amount and further our understanding of the feasibility of asteroid mining. The concept also includes the potential environmental impact and the need for regulation and safety measures in space activities.



An illustration of a Nano Satellite, the CUBESAT, broken down into several layers.

Credit: *Alen.Space A GMV Company*

Advanced Space Manufacturing: Forged in the Stars

Space manufacturing has taken a giant leap forward. The unique conditions of space—such as microgravity and vacuum—are ideal for producing ultra-pure pharmaceuticals, high-performance materials, and advanced electronics. This year has seen projects align with this trend, pushing the boundaries of what can be manufactured in orbit.

Two examples of utilising microgravity and vacuum conditions to produce ultra-pure pharmaceuticals are:

1. **Ritonavir Production in Space:** Varda Space Industries successfully crystallised a metastable form of the HIV/AIDS medication ritonavir in space. The process took advantage of the microgravity conditions to produce a high-quality crystalline form of the drug, which could potentially lower the cost of this life-saving medication.
2. **SpacePharma's Microgravity Labs:** SpacePharma has developed autonomous remote-controlled microgravity labs that can be launched into space aboard nanosatellites. These labs are designed to perform drug research in orbit, taking advantage of the unique conditions of microgravity to improve drug design, delivery, and storage.

Company (SpacePharma) Launches Remote-Controlled Lab for Drug Development in Microgravity.

Credit: *www.themedialine.org*

Satellite Sector Advancements

The satellite sector has seen robust growth, driven by the space bound companies. The expansion of satellite constellations with thousands of new small satellites has been pivotal in delivering next-generation global broadband coverage. High-throughput satellites (HTS) have taken center stage, offering enhanced data transfer capabilities and revolutionising satellite communication services.

HTS represent a significant evolution in satellite communications technology. They are designed to provide substantially more throughput than traditional Fixed Satellite Service (FSS) satellites, often by a factor of 20 or more, for the same amount of allocated orbital spectrum. This efficiency is achieved through the use of advanced technologies such as spot beam technology, which allows for high-level frequency reuse across multiple narrowly focused beams. These beams are similar to cellular networks on Earth and enable the satellite to cover specific areas with increased capacity.

HTS systems have been primarily operating in the Ka-band, but there has been a shift towards Ku-band HTS satellites as well. The move to lower orbits, such as Medium Earth Orbit (MEO) and Low Earth Orbit (LEO), is also a trend in HTS systems. This shift reduces the propagation delay for internet protocol transmissions, which is beneficial for applications requiring low latency, such as video chats, online gaming, and automated stock trades.

The cost-effectiveness of HTS is another notable advantage. While traditional FSS bandwidth can be quite expensive, HTS systems like ViaSat-1 can provide a gigabit of throughput in space for a fraction of the cost, making satellite communications more accessible and affordable.

Overall, HTS systems are transforming the satellite communications landscape, offering

higher capacity, reduced costs, and the ability to support a wide range of consumer and commercial applications. They are a key component in the ongoing efforts to connect the unconnected and provide secure, resilient communications across diverse industries and locations.

Space Traffic Management

As Earth's orbits become increasingly crowded, space traffic management has become a critical concern. Sophisticated software and artificial intelligence are now being used to orchestrate and automate orbital movements, preventing satellite collisions and ensuring the safe operation of space activities. The implementation of new international frameworks has been crucial in setting responsible space practices.

The UK government has outlined its commitment to becoming a significant player in the space sector through the National Space Strategy. This includes investments in space surveillance infrastructure, regulatory leadership, and the development of a Space Sustainability Standard in collaboration with Lloyd's of London and other leading space insurers. The aim is to promote competition while managing space debris and fostering sustainable practices.

The UK has also invested in SST innovation projects to improve the understanding and management of space objects. This includes the deployment of satellite tracking systems and the development of collision avoidance algorithms. The UK Space Agency (UKSA) and the Ministry of Defence (MoD) have also signed an agreement to work together on Space Domain Awareness.

Smart Advanced Propulsion Innovation

Propulsion technology has seen innovative

strides this year. Researchers and engineers are exploring solar sails, plasma engines, and even nuclear fusion as potential methods for interstellar travel. These advancements in propulsion technology are not only enhancing the efficiency of space travel but also opening up new possibilities for exploration.

Solar sails: These are propulsion systems that use the pressure of sunlight to propel spacecraft. The concept involves large, reflective sails that capture the momentum of photons from the sun, providing a continuous and fuel-free means of acceleration.

Plasma engines: Plasma propulsion systems, such as ion or Hall-effect thrusters, use electric power to ionize a propellant like xenon and generate thrust. These engines are highly efficient for long-duration space missions.

Nuclear fusion: This advanced concept involves using nuclear fusion reactions to produce high-speed jets of plasma, potentially allowing for rapid travel between planets and even to other star systems.

Conclusion

2024 has marked a pivotal chapter so far in the chronicles of space technology. The strides taken in this domain have profoundly enriched our comprehension of the cosmos, unveiling mysteries that have long captivated humanity. These technological leaps have not only expanded our current capabilities but have also established a robust foundation for the odyssey that lies ahead.

As we persist in our quest to innovate and transcend the boundaries of possibility, the realm of space technology stands as a resounding tribute to human creativity and our unyielding quest for enlightenment.

As we gaze into the future, the implications of this year's achievements are bound to reverberate through the forthcoming era of space exploration. The knowledge we've garnered and the technologies we've developed are stepping stones to even more audacious endeavours—colonising distant worlds, harnessing the resources of asteroids, and perhaps even discovering other life. Space technology is the canvas upon which our boldest dreams and aspirations may one day be realised.

It encapsulates the spirit of exploration that is intrinsic to our nature and continues to fuel the collective imagination of our minds, towards horizons yet unseen.

Author: *Alex Rutherford is an engineer at Leeds Children's Hospital and member of the British Astronomical Association.*

AI Professional Accreditation Framework

START YOUR REGISTRATION JOURNEY TODAY

The Convergence of AI and Green Chemistry

A Sustainable Future in Science and Engineering

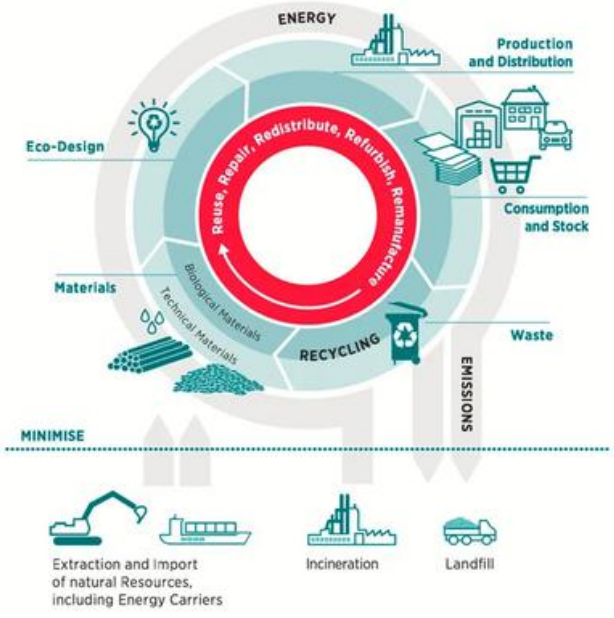
Alistair Field

In the ever-progressing fields of science and engineering, the convergence of artificial intelligence (AI) and green chemistry stands out as a vital technology required for the 21st Century.

The world stands at a pivotal crossroads where the path to sustainable innovation is not just a choice but a necessity. This synergy is not only revolutionising the way we approach chemical processes but also paving the way for a more sustainable and environmentally friendly future. As we grapple with the pressing challenges of climate change and resource depletion, the role of innovation in driving sustainability has never been more critical.

The Circular Economy: A Sustainable Business Model

The circular economy model has gained momentum, transforming how businesses operate. By prioritising the re-use and recycling of materials, companies are minimising waste and creating closed-loop systems that contribute to a more sustainable economy. Innovations in material science, such as biodegradable plastics and composites, are supporting this shift, enabling a future where products are designed with their end-of-life in mind.



A simplified model of the circular economy.

Credit: *Lauten-Weiss and Ramesohl (2021).*

The Green Tech Revolution

2024 marks a significant leap in green technology. Innovations in solar and wind energy have seen efficiency levels soar, making them more viable than ever. Battery technologies have advanced, with breakthroughs in solid-state and lithium-sulphur batteries offering higher energy densities and longer life cycles. These developments are crucial in powering everything from electric vehicles to smart grids, reducing our reliance on fossil fuels.

AI-Driven Green Chemistry

Artificial intelligence is emerging as a key player in sustainability. AI algorithms are being used to predict and manage energy consumption in smart cities, optimise routes for electric public transport, and even monitor biodiversity. The potential of AI to process vast amounts of environmental data is unlocking new opportunities for conservation and sustainable development.

Green chemistry, the design of chemical products and processes that reduce or eliminate the use or generation of hazardous substances, has seen accelerated expansion in recent years. AI has played a pivotal role in this growth, offering predictive capabilities that

enhance the outcomes and environmental impact of new chemicals and processes. The integration of AI in Research and Development is reshaping chemistry and drug discovery, with generative AI impacting the field significantly.

Breakthroughs and Innovations

AI algorithms now offer improved predictions for green chemistry outcomes, enabling researchers to design safer chemicals and more efficient reactions. This has led to the development of novel materials and processes that are less toxic and more biodegradable.

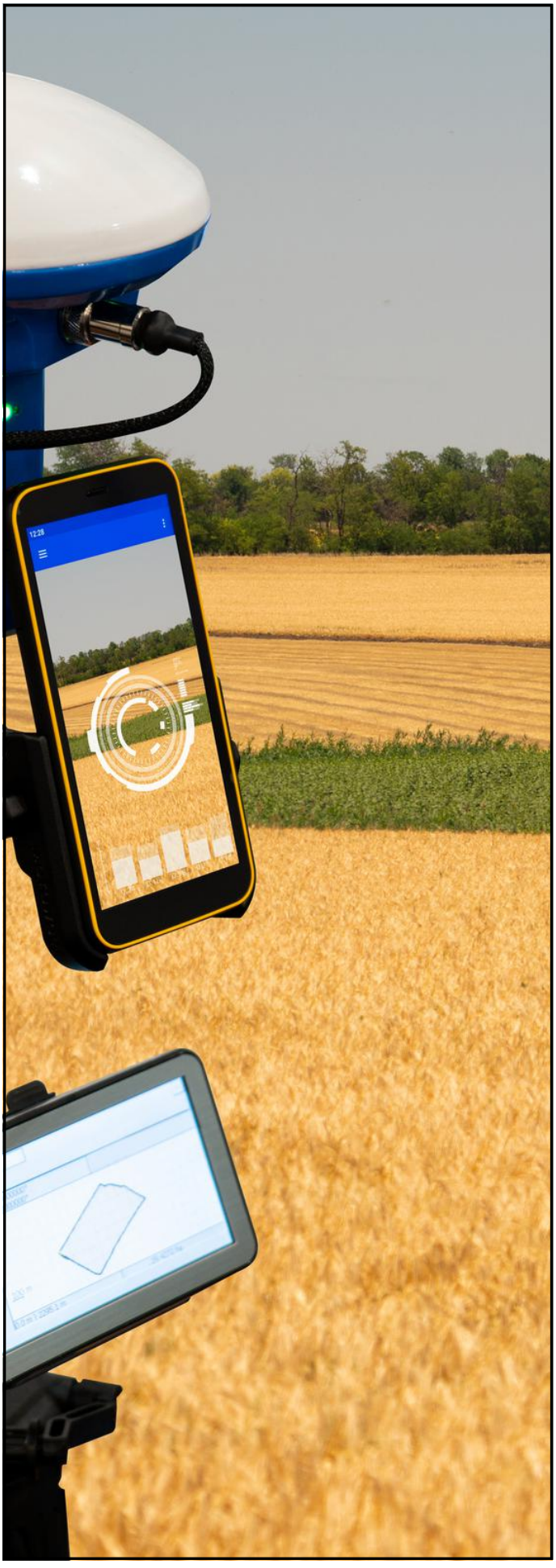
Moreover, AI's role in therapeutic antibody discovery is gaining popularity, with platforms driven by AI helping to advance research in creating more sustainable pharmaceuticals. These innovations are crucial in reducing the environmental footprint of the chemical industry and promoting a healthier ecosystem.

Ethical Considerations and Challenges

While its contributions to green chemistry are significant and while innovation drives sustainability, AI also brings challenges and ethical considerations. The accuracy and accessibility of training data, fairness, bias, and regulatory oversight are among the concerns discussed in the scientific community. Ensuring that AI systems are developed and used responsibly is paramount to maintaining public trust and achieving sustainable progress.

Impact on Science and Engineering

The impact of the AI and green chemistry convergence on science and engineering is profound. It has led to more sustainable practices across various industries, from pharmaceuticals to agriculture. The ability to design environmentally benign chemicals and processes is transforming the sector, making it more aligned with the principles of sustainability.



The Role of AI in Advancing Green Chemistry

AI's predictive power is enabling scientists and engineers to foresee the environmental consequences of their work, leading to more informed decision-making. By simulating reactions and predicting outcomes, AI is reducing the need for trial-and-error in laboratories, saving time, resources, and reducing waste. Precision farming, powered by AI and IoT (Internet of Things technologies), optimises resource use, reducing the need for water, fertilisers, and pesticides. Genetically modified crops that are drought-resistant and have higher yields are becoming more accepted, provided they are regulated responsibly. These technological advancements in agriculture are ensuring food security while preserving the environment.

The Future of Green Chemistry and AI

Looking ahead, the relationship between AI and green chemistry is expected to grow even stronger. As AI technologies continue to evolve, they will provide even more sophisticated tools for scientists and engineers to create solutions that are not only effective but also sustainable. The potential for AI to aid in the discovery of new green materials and energy sources is particularly exciting.

The convergence of AI and green chemistry represents a beacon of hope for a sustainable future. It exemplifies how technology can be harnessed to protect our planet while advancing human knowledge and capabilities. As we move forward, it is essential that we continue to support and invest in this vital area, ensuring that the benefits of AI are used to foster a greener, more sustainable world.

Author: *Alistair Field works as a researcher at Institute for Agriculture and Trade Policy.*

Creative UK: Catalysing Innovation in the Creative Industries

JP Ashton-Kinlin

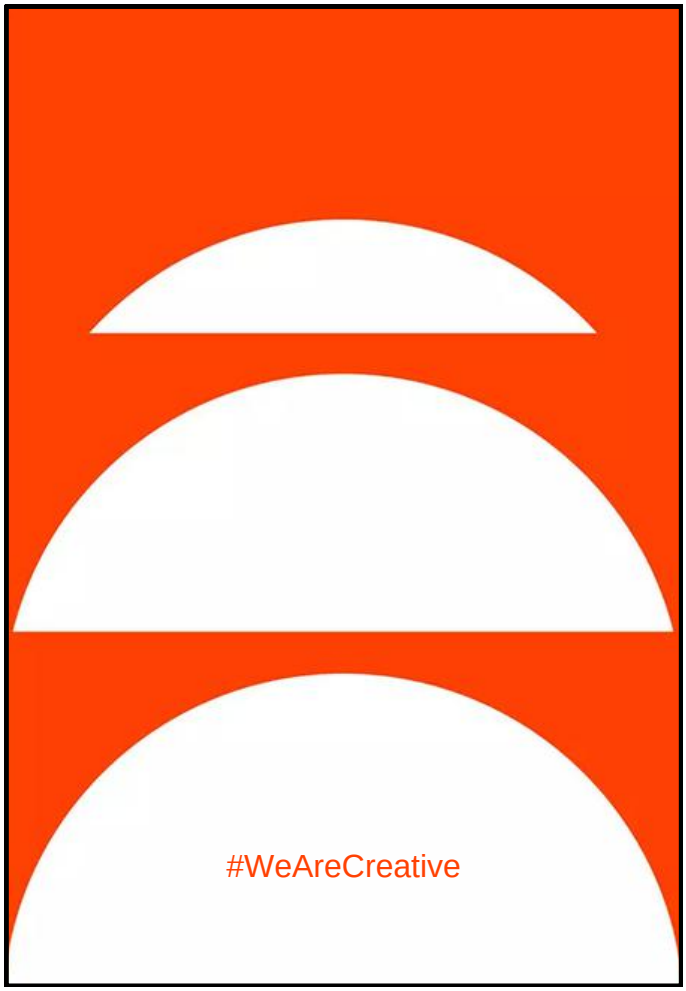
In the vibrant landscape of the creative industries, Creative UK has emerged as a pivotal force, driving innovation and fostering growth within the technical community. Since its inception, Creative UK has been instrumental in championing creativity, advocating for the sector's interests, and nurturing the talents that fuel its progress.

In pursuit of a shared goal, the IST has collaborated with Creative UK to advance both organisations initiatives, by providing a framework for accreditation. This framework is designed to highlight the technical workforce's expertise, skills, knowledge, and abilities. Technicians, often the overlooked backbone of any workforce, merit acknowledgment for their exceptional contributions. The new professional registration can be viewed on the IST website, and applications are now being accepted.

Who are Creative UK?

Creative UK is a not-for-profit organisation that supports the creative industries across the United Kingdom. Their goal is to cultivate a world where creativity is championed, valued, and nurtured, contributing to the UK's culture, economy, and education system. They emerged from the merger of Creative England and the Creative Industries Federation, combining industry insights with advocacy and support.

Creative UK advocate for the creative industries, influencing policy and bringing about change on a larger scale. They connect talent, businesses, and organisations across various sectors, from arts and culture to film, TV, video games, design, publishing, architecture, and more. Creative UK provide practical support



and investment, identifying untapped potential to accelerate growth.

Commitment to Creativity and Technology

Creative UK's impact on the technical community is multifaceted, reflecting its commitment to intertwining creativity with technological advancement. By investing in cutting-edge research and development, Creative UK has positioned the UK at the forefront of the virtual production revolution, enhancing visual effects, motion-capture technology, and AI applications for screen industries and live performances.

Creative UK has demonstrated a strong commitment to creativity and technology, below are some examples of how they have empowered the technical workforce:

- **Creative Growth Finance Fund**: Creative UK, in collaboration with Tridios Bank, plans to expand their Creative Growth Finance Fund from a £20 million venture to a £35 million debt and equity investment fund for the Creative Industries. This fund is a testament to their commitment, aiming to provide the crucial investment needed to unleash the power of the creative sector to drive UK growth and innovation.

- **Annual Reports and Initiatives:** Their annual reports highlight the organisation's belief in the power of creativity and the creative industries to change lives, placing creativity at the heart of the UK's culture, economy, and education system. They have also launched initiatives like the Redesigning Freelancing campaign* and the Creative Coalition Festival, which bring together leaders and practitioners to discuss and celebrate creative technologies.

- **Advocacy and Policy Recommendations:** Creative UK actively engages with the government, providing formal recommendations and participating in committees to advocate for the value and impact of creativity and technology in the UK.

* *Redesigning Freelancing campaign*
This initiative aims to deliver a policy framework that empowers freelancers and organisations working across the creative economy, tackling inequalities and fostering a more sustainable future for the self-employed workforce.

Advocacy and Policy Influence

Creative UK's influence extends into the realm of policy and advocacy. By engaging with government bodies and providing evidence to committees, such as the House of Lords Communications Committee, Creative UK ensures that the voices of the technical community are heard at the highest levels. This advocacy has led to the development of policies that support the sustainable growth of the creative industries, including the technical sectors that underpin them.

Creative UK wields significant policy influence through its championing of the creative industries. They make an impact through:

- **Policy & Advocacy:** Creative UK actively champions the priorities of its members, working with them to influence both policy and practice. They unite the UK's Creative Industries with a powerful voice, holding the government accountable and campaigning for change.

- **Strategic Priorities:** Through consultation with members, Creative UK has set strategic policy priorities, such as Redesigning Freelancing, Accessing Finance, and Championing Creative Skills.

- **Government Engagement:** They engage with the government by providing formal recommendations, participating in committees, and advocating for the value and impact of creativity and technology in the UK.

- **Visibility and Impact:** By merging the industry insights and advocacy work of the Creative Industries Federation with the practical support and investment work of Creative England, Creative UK is positioned to drive visible change and have a real impact on policy.

Addressing Industry Challenges

The organisation has not shied away from addressing industry challenges head-on. In response to the rising workplace harassment allegations, Creative UK has joined forces with Times UP UK, demonstrating its commitment to creating a safe and inclusive environment for all technical professionals.

Creative UK has been proactive in addressing the challenges faced by the creative industries. Below are some examples of how they've tackled these issues:

- Diversity and Inclusion: Creative UK has acknowledged the importance of promoting diversity within the creative workforce and its audiences. They have supported initiatives and programmes aimed at increasing representation and inclusivity across the sector.

- Skills Development: Recognising the skills shortage, Creative UK has invested in education and professional development to nurture the next generation of creative leaders. This includes supporting courses and training that equip individuals with the necessary skills to drive the sector forward.

- Access to Funding: To combat the uneven access to funding, Creative UK has worked on expanding financial support for the creative industries. This includes advocating for government investment and providing resources to help creative businesses explore new projects and take risks.

- Addressing Sector Challenges: Creative UK has identified key priority areas such as integration and disintegration, understanding innovation's impact on business models, and supporting small firms' growth. They have conducted studies and provided recommendations to address these challenges.

- Promoting Cultural & Creative Industries: In response to concerns about the UK losing its leading position in the creative industries, Creative UK has been vocal in promoting the sector's potential and highlighting the need to address skills shortages and other challenges to ensure future success.

As we look to the future, the role of Creative UK in shaping the technical community remains crucial. Its continued support and advocacy promise to unlock even greater potential within the creative industries, ensuring that the UK remains at the cutting edge of innovation. The synergy between creativity and technology, championed by the partnership between the IST and Creative UK, not only drives economic growth but also enriches the cultural tapestry of the nation.

You can find out more about the creative registration framework online at our website: https://istonline.org.uk. Applications can be submitted at any time of the year and the IST are here to provide support and further information, if required.

Applying for Professional Registration: Planning Your Competence Report

1 Think of 5–10 examples of things you have done in your job in the past 3 years

They can be standout, standalone things, or examples of the work you do every day. Try and think of things of which you are especially proud.

Make them varied.

Include times when you have taken a lead on things, when you have been a troubleshooter, when you have used your knowledge to help and support the knowledge of others, when you know your contribution has had a significant outcome, etc.

The majority should be individual examples, rather than times you did something as part of a team.

2 Break your examples down

For each of these instances, think of how you **applied your knowledge** and **personal responsibility**, used your **communication and teamwork skills** and **professional practice**, and **personal and professional development**.

For example, if you were using a machine or a method and it wasn't working correctly, don't just think about what protocol you followed – think about how you knew which protocol would work.

?

Why did you select it, how did your skills dictate your choices, and what was the outcome.

It isn't enough to just describe what happened.

3 Tackle the sections methodically

Use the key words of each section to help you. If a question asks you how you "review" or "select" something, make notes under both these words. Stay away from being too general.

Flesh out your answers using the notes you made above your examples. Take into consideration the categories, for example section D is all about personal responsibility, so talk about this aspect.

Top tips

- Be detailed
- Be clear on your own role, **use "I" not "we"** as far as possible.
- Don't be general –be specific –it's better to write too much than too little.
- Commit to filling in at least 1 section a week until the competence report is complete.

iST Creative UK

If you need more help, get in touch:
registrations@istonline.org.uk

Navigating Cybersecurity Trends, Safeguarding Our Digital Future.

Evelyn Wood

As we advance further into the digital age, cybersecurity remains a critical concern for individuals, businesses, and governments alike. New cybersecurity trends are emerging that reflect the evolving landscape of threats and the measures required to counter them. This article explores these trends and offers insights into how we can safeguard our digital future.

Emerging Cybersecurity Trends:

One of the most significant trends is the rise of **Generative AI** (**GenAI**). While GenAI offers promising capabilities in augmenting security operations, it also presents new challenges to manage. Security leaders are adopting a cautious approach to GenAI, recognising its potential but also the need for ethical, safe, and secure use.

Another trend is the increasing focus on cybersecurity **outcome-driven metrics** (**ODMs**). These metrics enable stakeholders to understand the direct impact of cybersecurity investments on protection levels, bridging the communication gap between security teams and boardrooms.

ODM's typically measure **(1)** risk reduction; assessing the effectiveness of cybersecurity measures in reducing the risk of cyber threats and vulnerabilities. **(2)** Financial impact mitigation; evaluating how cybersecurity efforts minimise the financial consequences of cyber incidents. **(3)** Strategic alignment; measuring how well cybersecurity initiatives support and align with the broader strategic goals of the business. **(4)** Operational effectiveness; gauging the outcomes of cybersecurity investments and the level of protection delivered in a business context, and **(5)** technology readiness; measuring the readiness of technology to support business outcomes and manage risk.

AI threats have also become a prominent concern. The sophistication of AI techniques, such as advanced phishing campaigns and deepfakes, requires organisations to prepare for a new wave of cyberattacks. Specialised language models are being developed to provide tailored insights and help security teams swiftly adapt to evolving threats.

Safeguarding Our Digital Future

- Assessing vulnerabilities to protect against these emerging threats requires a multifaceted approach. Quantitative risk analysis is the first step in identifying potential weaknesses.
- Reviewing cloud architecture and security capabilities ensures that digital infrastructures are robust and resilient.
- Enhancing incident response and recovery capabilities is crucial for minimising the impact of cyberattacks. Organisations must be prepared to respond quickly and effectively to security breaches.
- Prioritising a cybersecurity budget is also essential. This includes investing in a skilled talent pool and optimising resources through automation to manage cyber risks more efficiently.

These cybersecurity trends highlight the dynamic nature of the digital threat landscape.

By staying informed about these trends and implementing strategic measures to counteract them, we can ensure the security and resilience of our digital future.

It is through proactive and collaborative efforts that we can navigate the complexities of cybersecurity and maintain the integrity of our digital world.

Author: *Evelyn Wood works in the Fraud Prevention and Detection team at the Royal Bank of Scotland.*

CALL FOR ARTICLES

At the IST, we want to encourage all of our members to submit short articles for our publications; The Tech Magazine or The Journal. Our members would like to see more articles from our Fellows and from our early-career technicians.

If you work at a senior/managerial level, we would encourage you to allow your team members to contribute also, so that they also have the opportunity to publish articles.

These are how the IST will help you:

- **Incentives:** Offer rewards such as recognition in the publications and professional development opportunities for those who contribute. All authors are credited for their article submission. Submitting to the publications can also contribute to your annual CPD review.

- **Contents/Themes:** The wall of contents shows the areas and themes for submissions to provide direction and inspire members to write about relevant topics. We have many areas and themes for members to write about.

- **Ease of Submission:** Simplify the submission process with clear guidelines and an easy-to-use platform. We have simplified the process by giving documents and example articles. We have a template for members to use to submit their article.

- **Spotlight Features:** Highlight articles and authors in publications, websites, or social media to give contributors visibility. Our authors who submit articles will be highlighted across our publications and marketing platforms.

- **Collaborations:** Encourage collaborative articles among members to share different perspectives and reduce the individual writing load. If members are struggling to complete an article, we will assist to help bring the technical workforce together to collaborate.

- **Editorial Support:** Offer editorial assistance to help refine articles and ensure quality content. The Editorial Board will provide constructive feedback to contributors, showing that their work is valued and helping them improve.

- **Regular Reminders:** Send out regular calls for submissions, reminding members of deadlines and the importance of their contributions.

By implementing these strategies, the IST can create a supportive environment that motivates members to share their knowledge and experiences through short articles.

Please send your articles to:

office@istonline.org.uk

The Tech Magazine Vol. 5 No. 1
Release - April/May 2024

- Call for articles: Jan/Feb/Mar
- Deadline for submissions: 18th March

The Tech Magazine Vol. 5 No. 2
Release - August / September

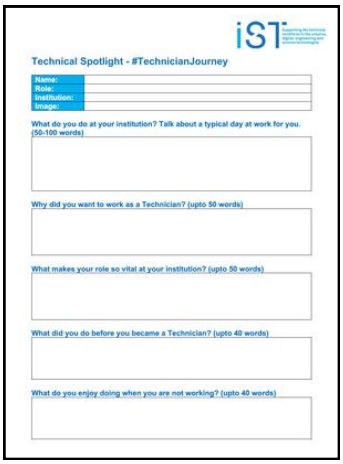
- Call for articles: Jun/Jul/Aug
- Deadline for submissions: 5th August

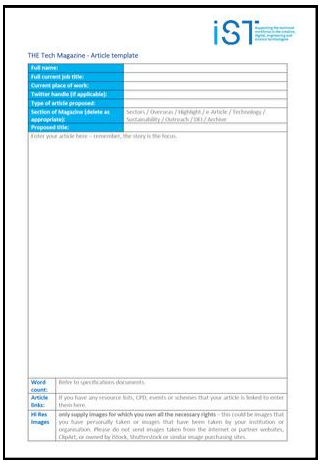
The Journal
Release - December 2024

- Call for articles: All Year
- Deadline for submissions: 30th November

You can request the forms below from:

office@istonline.org.uk





Article Specifications

Sector Specific Articles	Industry, Business & Consultancy | Research Institutes | Higher Education | Schools & Colleges | Overseas	300 – 400 words
Technical Spotlight	*See individual specs for this on page 2*	230 – 270 words
Highlight articles	Special Highlight	300 – 400 words
E-Articles	Articles from all disciplines as Full Papers, Communications, Reviews	1,000 – 2,000 words
Technology Articles	Creative | Digital | Engineering | Science	300 – 500 words
Special Interest Articles	Equality, Diversity & Inclusion | Outreach & Engagement | Sustainability	300 – 500 words

Format and layout of your articles

Keep your writing clear and concise, avoiding repetition or embellishment. All submissions must be in English. You are welcome to use common or standard abbreviations; if your abbreviations are non-standard, please include a definition the first time you use them.

All articles accepted for publication in our magazines and journals are edited and typeset to our house style by professional editors: the manuscript will be formatted for you.

If you would like professional guidance on improving the standard and style of your writing, before submitting your article, we can offer help, support and advice.

Article Types

Articles fall into one of three main categories: Full papers, Communications and Reviews. However, each journal will have further, specific article types, so you should always refer to the publications specific specifications while preparing your manuscript.

Full papers are original, unpublished primary research. Extensions of work that has been published previously in short form such as a Communication are usually acceptable.

Communications must contain original and highly significant work whose high novelty warrants rapid publication.

Reviews may be an authoritative overveiw of a field, a comprehensive literature review, or tutorial-style reference materials. Reviews are usually invited by the editor, but a topic may be proposed by an author via the Editorial Board.

LAUNCH OF THE NOVEL ACCREDITATION FRAMEWORKS
(ARTIFICIAL INTELLIGENCE AND CREATIVE INDUSTRIES & TECHNOLOGIES)

Endorsed by Creative UK, the Creative Registration Framework (CRF) offers professional accreditation for those working in the Creative Industries and Technologies. It aims to provide parity with existing schemes available in fields such as Science and Engineering.

"The Creative Industries are rich with highly skilled professionals, working across a range of specialities.

We're pleased to see accreditation being made available for individuals, in acknowledgment of the amount of talent that powers our amazing sector."

- Simon Hooper, Creative UK

In the first instance, a mid-career register has been developed and made available to creative technologists within the Higher Education sector.

CLICK HERE TO LEARN MORE

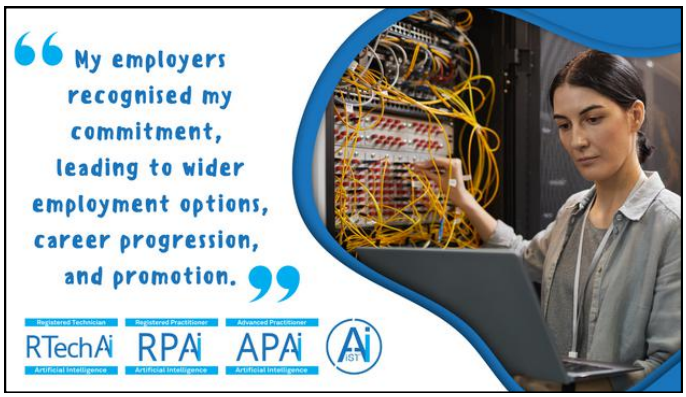
Ethical and Robust: the IST is making AI safer for Society with our new professional registration scheme.

This accreditation is for all who work with AI models and has been developed by an interdisciplinary group. You can be an archeologist, philosopher or computer scientist – as long as you work on AI models in any capacity this accreditation works for you.

Our accreditation verifies that practitioners are able to use AI robustly and ethically as well as raise and deal with modelling challenges.

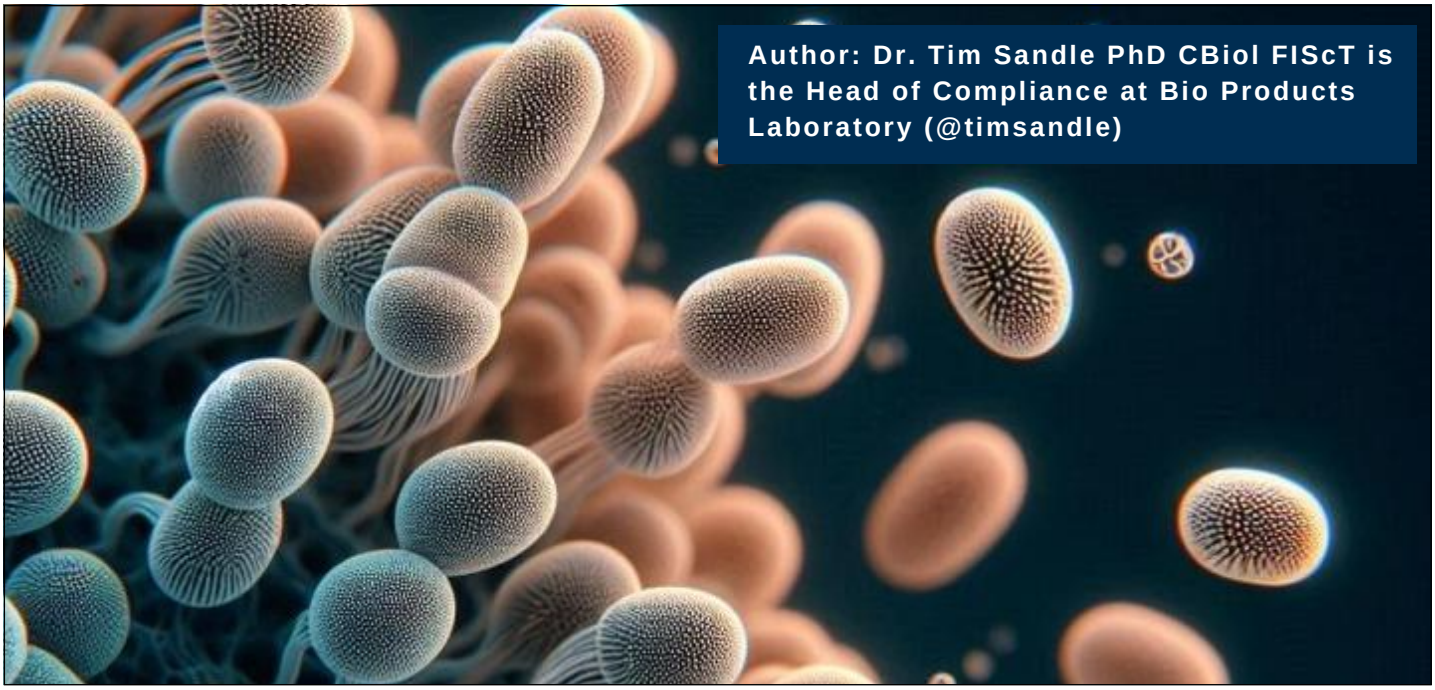
This accreditation closes the gap between employers and employees by providing a standard accreditation that is instantly recognisable. Employers know that the applicant is certified to model robustly and the employee can prove their status.

CLICK HERE TO LEARN MORE



Spore liberation: How and why fungal spores move through the air

Dr Tim Sandle, Ph.D., CBiol, FIScT



Author: Dr. Tim Sandle PhD CBiol FIScT is the Head of Compliance at Bio Products Laboratory (@timsandle)

Dr Tim Sandle, Ph.D., CBiol, FIScT explains how spores spread throughout Healthcare environments.

When do fungi release spores? How far might these spores travel? Will these spores survive for a prolonged period? These are questions of importance to microbiologists in many sectors, and you can read the answers presented by Dr Sandle by following the link below.

Credit: Dr Tim Sandle, Microbiology News. LinkedIn: https://www.linkedin.com/pulse/spore-liberation-how-why-fungal-spores-move-through-tim-scnye/?trackingId=0NXAWpjqFGtnMqQ4tCzf2g%3D%3D

Scientific Laboratory Show and Conference 2024

Arthur Nicholas and Michelle Jackson were at the SLS Conference on 22nd May speaking to members and technicians in attendance. *Picture to the right shows Arthur catching up with colleagues/members at the IST stand.*

Michelle, IST Registrar, also delivered a presentation on CPD for delegates on the day.

If you are at any future events, we look forward to seeing our members so please feel free to come and have a chat.

Queen's University Belfast Showcase 2024

Queen's Technicians attended the 3rd Queen's University Technician Showcase, on Thursday 23 May 2024. The event was opened by the President and Vice Chancellor.

They hosted visitors from the Institute for Technical Skills and Strategy (ITSS) and UK and Irish Universities. This offered a tremendous opportunity to share best practice and celebrate Queen's success as a Technician Commitment signatory.

Joan Ward also attended and was lucky enough to catch-up with technical staff and colleagues. Well done Gillian Riddell and QUB Technicians.

AI Accreditation Framework

Marie Oldfield has been travelling across the length of the UK and abroad to showcase the new AI accreditation framework.

Marie and the AI team are always willing to travel to institutions and attend conferences to encourage professionals working in artificial intelligence to consider becoming registered. Marie has also been working closely with students to recruit members into the IST so that they can work towards the gaining registration through the AI Accreditation Framework.

IST MEMBER BENEFITS

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Dell UK is proud to partner with the Institute of Science & Technology to provide a range of discounts on selected products.

Benefits for IST members include:

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AI in 2024: Trends, Breakthroughs, Ethics and Impact

The IST AI Bot

Artificial intelligence (AI) continues to shape our world in profound ways. The rise of various AI technologies has been a testament to this transformative power, witnessing significant trends, breakthroughs, and ethical considerations that have reshaped industries and societies alike. The future of AI is not just about technological prowess, but also about the wisdom with which we guide its development and integration into the fabric of our lives.

Current Trends in AI

The landscape of AI in 2024 is marked by several key trends that are driving innovation forward Generative (or gen) AI utilises sophisticated machine learning models, particularly deep learning models, which simulate the learning and decision-making processes akin to the human brain. Gen AI has become abundant, with applications ranging from content creation to drug discovery. Multimodal models have risen, capable of understanding and generating text, images, and even videos, thus enriching the user experience and expanding AI's utility.

These models are constructed on large datasets to recognise patterns and relationships within the data. After training, they can generate new data that resembles the input they were trained on, effectively creating new content that did not previously exist. Gen AI has been making headlines, especially with the advent of systems like ChatGPT, and is being used across various industries for tasks ranging from software development to art creation. It's a rapidly evolving field that holds great promise but also presents challenges and risks that need careful consideration.

Another trend is the seamless integration of AI into workflows, where AI tools are becoming an integral part of business processes, enhancing efficiency and decision-making. AI integration into workflows is a transformative process that leverages artificial intelligence to enhance and automate various business processes. Below is a high-level overview of how AI is integrated into workflows:

1. **Identify Pain Points and Opportunities:** The first step is to pinpoint areas within your workflow that could benefit from automation or improved efficiency.
2. **Set Clear Objectives:** Define what you aim to achieve by integrating AI, such as reducing manual tasks, improving decision-making, or enhancing customer experiences.
3. **Understand Your Data:** AI thrives on data. Assess the quality and quantity of data available, as they will fuel the AI algorithms and determine their effectiveness.
4. **Choose the Right AI Tools and Technologies**: Select AI solutions that align with objectives and can seamlessly integrate with your existing systems.
5. **Develop a Proof of Concept (PoC)**: Before full-scale implementation, create a PoC to demonstrate the feasibility and value of the AI integration.
6. **Collaborate with AI Experts:** Work with AI specialists to ensure technology is correctly implemented and to its full potential.
7. **Integrate AI into Existing Workflows:** Seamlessly incorporate AI tools into your current processes, ensuring minimal disruption and maximum adoption.
8. **Continuously Monitor and Improve:** AI systems should be regularly assessed and refined based on performance data and user feedback.

AI workflow automation can include chatbots for customer service, automated email marketing, predictive analytics for supply chain demand, and automatic data analysis and reporting. These AI-driven processes can significantly improve efficiency, allowing human workers to focus on more strategic tasks.

For businesses, the benefits of AI workflow integration are substantial, including increased productivity, cost savings, and the ability to make more informed decisions. However, it's important to approach integration thoughtfully, ensuring that AI tools are user-friendly, secure, and scalable to meet the growing needs of the business.

Personalisation has also taken center stage of trends, with AI systems offering tailored experiences and solutions to individual users. Amidst these advancements, regulation and ethics remain at the heart of debates, ensuring that AI development aligns with societal values and norms.

Breakthroughs in AI

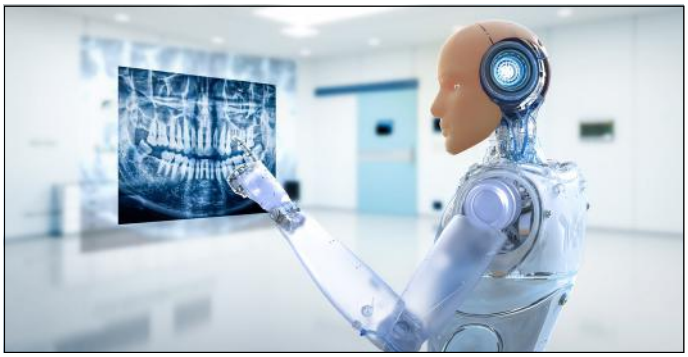
The year to date, has seen remarkable breakthroughs that have pushed the boundaries of what AI can achieve. Customised chatbots have become ubiquitous, allowing businesses and individuals to create their own AI assistants with ease. These chatbots are not only text-based but can also process and generate multimedia content, making them versatile tools across various domains.

In the realm of large language models (LLMs), we've witnessed the development of smaller, more efficient models that maintain high performance while being accessible to a broader audience. These models have democratised AI, enabling a wider range of users to harness the power of advanced AI without the need for extensive resources.

Ethics of AI

As AI systems become more integrated into our lives, ethical considerations have gained prominence. The Global Forum on the Ethics of AI, hosted by UNESCO, has brought together experts to discuss the ethical governance of AI, focusing on equity, diversity, and non-discrimination. The forum emphasised the importance of human oversight and the need for AI systems to be transparent, fair, and accountable.

Concerns about privacy erosion, algorithmic bias, and job displacement have also been addressed, with key ethical frameworks being developed to navigate these challenges. These frameworks aim to ensure that AI contributes positively to society and does not exacerbate existing inequalities.



Impact of AI

The impact of AI is multifaceted, affecting various aspects of society and the economy. AI has been a driving force for innovation, with the potential to solve global challenges and boost productivity. However, it has also raised concerns about its effect on jobs, with some estimates suggesting that AI could replace a significant portion of full-time jobs, particularly in routine tasks.

On the positive side, AI has made significant contributions to healthcare, improving access to medical services and enabling personalised treatment plans. In the environmental sector, AI has been applied to tackle climate change, offering solutions for sustainable development. Economically, AI has empowered businesses, driving cost reductions and revenue increases. Below are a few examples of the impact of AI:

Positive Impacts:

- Efficiency and Automation: AI automates repetitive tasks, increasing efficiency and freeing up time for people to engage in more complex activities.
- Data Analysis: AI excels at analysing large datasets, leading to more informed decisions in various fields.
- Medical Advancements: AI aids in medical diagnosis and research, improving patient outcomes and accelerating discoveries.
- Economic Growth: AI has the potential to boost the global economy significantly, with some estimates suggesting a 7% increase.

Negative Impacts:

- Job Displacement: AI could replace the equivalent of 300 million full-time jobs globally, affecting administrative, legal, and management roles.
- Ethical Concerns: Issues of bias, privacy, and the ethical use of AI are prominent, requiring careful governance.
- Security Risks: The susceptibility of AI systems to hacking poses significant security risks.
- Social Impact: AI can affect societal structures, potentially leading to increased inequality if not managed responsibly.

Broader Societal Impacts:

- Transformative Potential: AI is transforming our world, and it's crucial for society to become informed and engaged in how this technology is developed and implemented.
- Global Challenges: AI is being used to address global challenges such as illegal fishing, human trafficking, and gender imbalance.

AI's impact is not just limited to these areas; it's also shaping industries like transportation with autonomous vehicles, enhancing customer experiences through personalised services, and even influencing creative fields with new forms of art and music.

As AI continues to evolve, its impacts will only become more pronounced, making it essential for individuals and organisations to understand and adapt to these changes responsibly.

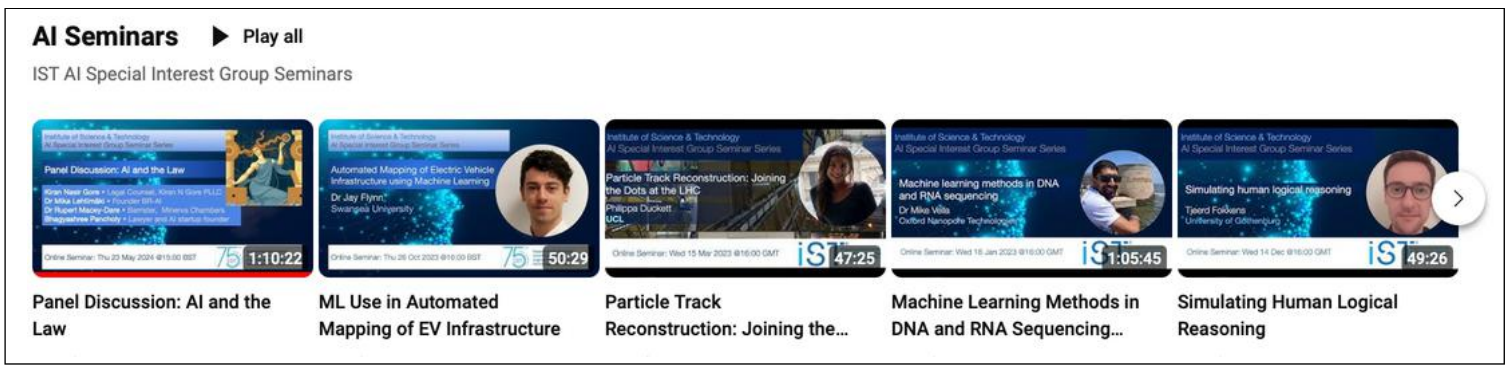
AI Seminar - Panel Discussion: AI and the Law

Richard Saldanha CStat CSci APAI FIScT MIET

The Institute of Science & Technology's AI Special Interest Group was delighted to announce the next in its series of seminars and welcomed Kiran Nasir Gore, Dr Mika Lehtimäki, Dr Rupert Macy-Dare and Bhagyashree Pancholy to talk about AI and the Law.

This panel discussion brought together four seasoned international legal professionals with more than a keen interest in AI developments relevant to the law. Their aim was to explore what AI means to legal practitioners and how AI currently is and is likely to affect legal decision making. In particular, the panel looked at hugely important ethical dimensions affecting all AI developments, often overlooked in the frenzy to simply get the technology working; the more mundane need to handle document filing in a smart manner; and other necessary elements of any legaltech implementation.

AI Seminar Series - Watch them all on YouTube



Colonisation or carelessness? Whisper, OpenAI and Indigenous Rights.

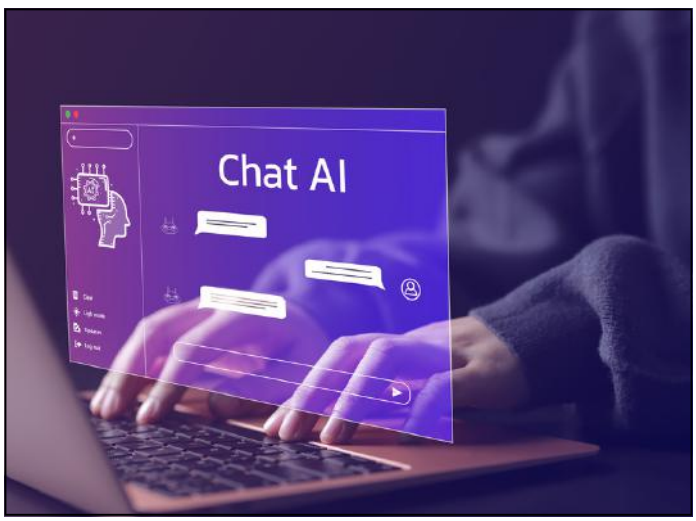
Alicia Colson, FIScT

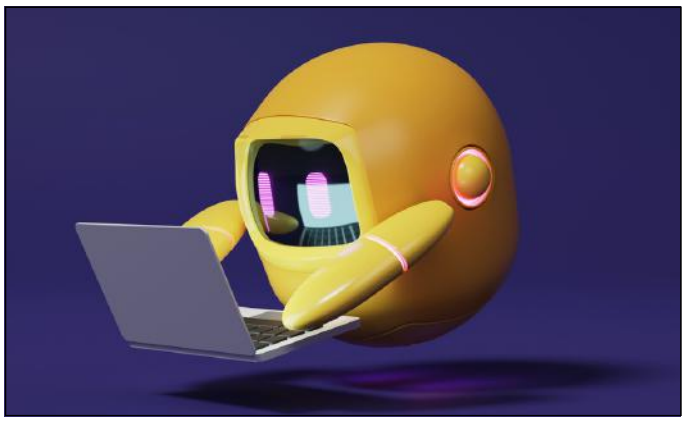
By now, people know of the term, or label, 'AI'. Many believe that they know what's meant by the term, but that's another story. Nonetheless, something known as “generative AI tools” are rapidly growing in popularity. Such tools learn how to take actions i.e. create new content based on existing data. Unlike other AI they do not simply identify and sort data into discrete categories. The algorithm takes actions based on data which is already created and manipulates that data to create ‘brand new’ content - a text, an image, even computer code - based on the training it has received.

ChatGPT, built by the US company OpenAI, backed by Microsoft, interacts with the user in a conversational manner. The model enables users to rapidly obtain a synthesis of what potentially overwhelming quantities of information. The company blog states:

“The dialogue format makes it possible for ChatGPT to answer follow-up questions, admit its mistakes, challenge incorrect premises, and reject inappropriate requests.’’

[Company website https://openai.com/blog/chatgpt Accessed 26/05/2023]





This chat bot (a computer program designed to simulate conversation with human users, especially over the internet) utilises what may is called a ‘large language’ model. It uses a text prompt to generate a human-like response in words. The language used is stilted but readable. It's not great literature. People indicate that they use this Chatbot to reduce the time needed to complete a task, obtain ‘the boiler plate text’ for a document, or find out the 'latest' information on something.

The same company subsequently released Whisper, a speech recognition tool which transcribes speech-audio into text which is spoken (ASR, Automatic Speech Recognition) and translated into English (speech translation). This is a valuable tool especially for those who only speak English. However, as a tool it can be prone to cause problems and abuse within various sectors (e.g. education, publishing), and could be used to produce disinformation.

Whisper was developed (trained) using data scraped off the web from dozens of languages including Māori, the language of the Indigenous peoples of New Zealand. These includes 680,000 hours of data, including 1,381 hours of the Māori language. Now, Amnesty International states Indigenous people represent about 5% of the globe's population

so there are 476 million Indigenous people spread across more than 90 countries. They speak more than 4,000 languages and belong to more than 5,000 different peoples.

It appears that the data used to train Whisper was harvested (scraped) without consent, agreement, from different groups of people. Understandably this raised an outcry in the press from the Indigenous peoples and their leaders. The obvious question is: was consent for the use of this data asked for and obtained? This is tough to ascertain. The harvesting of data without consent risks abuse, distortion of culture and deprivation of rights. The scraped data, used to train Whisper, will likely include biases or inaccuracies. Indigenous peoples want to control their own data and prevent the abuse, distortion, misuse and mis-understandings of the culture and deprivation of their rights by governments and private corporations alike. It should be remembered that Indigenous peoples neither share world views nor intellectual frameworks between themselves let alone with those individuals who had designed, built, and trained Whisper, in Open AI.

Consent to use of the data is crucial for everyone, especially for the Indigenous peoples. The seizure of their data reeks of the colonialism which has blighted their pasts. The fact that the Māori, in New Zealand, are outspoken in the press about Whisper's behaviour highlights the continual threats to the sovereignty, the lives and livelihoods of the world's Indigenous peoples, minorities, from governments, corporate entities, the military, environmental interests and tourism. Language enables people to communicate, exchange knowledge and build relationships. Each person’s memory, identity, cultural history, and traditions is stored, transmitted, by language. It's crucial to the definition of Indigenous identity, the identity as peoples who are distinct. It helps in the security of traditional knowledge and practices.

So, the disappearance of a language causes an integral part of the language's culture to disappear with it. Approximately 600 languages have disappeared during the 20th century. Languages disappear at a rate of one language every two weeks. UNESCO predicts that by the end of the 21st century that between 50-90% of indigenous languages (approx. 3000 languages) will disappear to be replaced with English, Mandarin or Spanish.

So, Open AI's attitude not only echoes the colonial past(s) experienced by the Indigenous peoples globally but implies that colonialism is ongoing. Regrettably this behaviour undermines the positive role which digital technologies can play to preserve and revive the use of Indigenous languages. It can even undermine our attempts to understand the survival and incorporation of Indigenous vocabulary in the major languages of the planet. Such behaviour fails to recognise that words from Indigenous languages often contribute to languages such as Brazilian Portuguese where from the words used on a

daily basis several / many? come from many of Brazil's Indigenous peoples. Today, more than 160 Indigenous languages and dialects are spoken but prior to the arrival of the Portuguese, there were probably 1,000 languages.

Conclusion

In the discourse of technological advancement and cultural preservation, the emergence of generative AI tools like ChatGPT and Whisper presents a paradox. On one hand, these tools signify a leap forward in human-computer interaction and accessibility, offering unprecedented convenience and efficiency. On the other hand, the methods by which these tools are developed—particularly the use of data without explicit consent—echo historical patterns of colonisation and exploitation.

The controversy surrounding Whisper's development underscores a critical need for ethical considerations in AI. The outcry from Indigenous communities is not just about data privacy; it's a call for respect and recognition of cultural sovereignty. The inadvertent or deliberate misuse of Indigenous data without consent is a modern form of digital colonialism, perpetuating the marginalisation of these communities.

As AI continues to evolve, it must do so with a conscientious framework that prioritises the rights and voices of all people, especially those from marginalised groups. The potential of AI to support and enhance human endeavours is immense, but it should not come at the cost of cultural erasure or infringement of rights. The future of AI must be shaped by a collaborative, inclusive approach that respects diversity and fosters trust. Only then can we harness the full potential of these technologies to benefit humanity as a whole, without repeating the mistakes of the past. The conversation around Whisper, OpenAI, and Indigenous rights is a reminder that innovation must be balanced with care, consent, and a commitment to the collective good of our global community.

Author: *Alicia Colson is a freelance archaeologist and ethnohistorian and a key Management Committee Member in the IST AI Group.*

Women in Tech Group Update

Joan Ward, FIScT

Women in Tech Seminar - 3rd April 2024

The WiT group hosted their seminar back in April with Professor Liz Bacon delivering a lunchtime session. Professor Bacon is the Principal and Vice Chancellor of Abertay University and she talked about her journey to her current role and the challenges she met along the way. Prof Bacon also spoke about the skills and expertise needed to manage and guide a modern-day University in such challenging times.

Prof Liz Bacon, is the past President of the BCS, The Chartered Institute for IT. She has also served on the Parliamentary IT Committee, responsible for communications, Past President of EQANIE (European Quality Assurance Network for Informatics Education). Prof. Bacon has been involved in software engineering and e-learning research for more than 10 years. She was identified as the 35th Most Influential Women in UK IT 2015, by Computer Weekly.

Next Seminar:

Wednesday 5th June 2024, 1-2pm

Marie Oldfield and Murray McMonies will discuss maternity/paternity leave and the implications of taking it on careers. Marie and Murray are both Fellows of the IST and have recently taken such leave.

The Future of Women in Technology: Challenges and Recommendations

Dr Marie Oldfield presented at the 7th International Conference on Gender Research (ICGR) and was in attendance in Barcelona, Spain over 25-26 April 2024 at the University Autonomy de Barcelona.Not only was Marie delivering the paper, the research for which was done in collaboration with the IST Women in Tech group, but she was also asked to sit on a number of the panel discussions that were scheduled in the Conference.

The paper can be viewed by clicking here, or by clicking on the paper below.

The following authors were involved in the paper: Marie Oldfield, Jan Brett, Lynn Baxter, Liz Bacon, Joan Ward and Margaret Ross.

The Future of Women in Technology : Challenges and Recommendations

Marie Oldfield[1], Jan Brett[2], Lynn Baxter[3], Liz Bacon[4], Joan Ward[5], Margaret Ross[6]
[1] LSE, London UK
[2] University of Liverpool, UK
[3] University of Sheffield, UK
[4] Abertay University
[5] Institute of Science and Technology
[6] BCS

Keywords: Gender, AI, Technology, Challenges, Professionalism

Abstract

When only women turn up to a panel on challenges for women in technology, how do we then reach out to industry, academia and government to encourage them to listen to the current challenges experienced by women in tech. Technology is rapidly changing and we are seeing women disadvantaged by less training opportunities, lack of role models, perceived penalties for taking time off to have children or discharge caring responsibilities as well as the risk that their jobs are subject to more automation. Multiple workshops at the Institute of Science and Technology highlighted significant challenges for women in tech, the data from our empirical study illustrates these challenges in detail. With the workplace still male dominated and the landscape changing rapidly, women have a significant role to play and we need to ensure that role is not only facilitated but the existing challenges are mitigated. This is a discussion paper with empirical data that illustrates challenges currently experienced by women in tech and how we can move forward to ensure not only equal opportunity but remove some of the challenges currently experienced. In this paper we have not considered the same impact on men who take career breaks for reasons of caring responsibilities.

Keywords Women, Technology, Challenges, Gender Bias, Women in Tech

Introduction

Over the last few decades, we have seen numerous initiatives put in place to try to ensure women have a fair pathway to success in the workplace. This has included policy generation, spotlights on EDI and sometimes, as in reverse engineering boards, some positive discrimination. However, what has been missed in this landscape is the critical provision of tools to enable women to take up opportunities. The understanding of the specific challenges facing women in the technological workplace has been missed. This is highlighted by Neveen et al. "there is no ambition gap. Roughly the same percentage of women and men—62% and 67% respectively—were trying for a promotion" (Neveen,2021). We can also see that the existing initiatives are not having enough impact as discussed by the Global Gender Gap Report "Overall, the global share of women in leadership roles as illustrated in this data is 31%, although shares vary by industry. In 2022, only select industries have levels near gender parity in leadership, such as Non-Governmental and Membership Organizations (47%), Education (46%), and Personal Services and Wellbeing (45%). At the other end of the range are Energy (20%), Manufacturing (19%) and Infrastructure (16%)" (Global Gender Gap Report 2022). The largest driver for female progression in the workplace being within businesses that were already highly represented "for example, women make up 62% of total workforce share in the Personal Services and Wellbeing industry, but only 45% of leadership share" (Global Gender Gap Report 2022). The biggest step for women, and one where most failure is seen, is the initial promotion step "For every 100 men promoted from entry level to manager, only 87 women are promoted, and only 82 women of colour are promoted" (Women in the Workplace 2022, McKinsey).

One of the main issues we chose to examine in this paper is caring responsibilities. In the Women in Tech group at the Institute of Science and Technology this discussion arose quite often. This is highlighted by Rocha et al. "several researchers report the impact of gender on software development teams, especially in relation to women. In general, women are under-represented on these teams and face challenges and difficulties in their workplaces. When it comes to women who are mothers, these challenges can be amplified and directly impact these women's professional lives, both in industry and academia" (Rocha et al., 2023). In addition, "one analyst said "millions of mums" were being forced to "pay the price" of a less secure career. The new research found

Empowering Women in Technology: Strategies for Success in 2024

Gender equality is increasingly becoming standard practice in the technology field, and it's essential for companies and their employees to maintain this progress by supporting women in tech roles and inspiring the younger generation to pursue careers in technology.

Despite significant strides in recent years, women continue to face unique challenges that hinder their full participation and advancement. This article explores the strategies that can empower women in technology, ensuring their success and fostering an inclusive environment where innovation thrives.

Building a Supportive Network

A robust support system is crucial for women in tech. Mentorship programs that pair experienced professionals with newcomers can provide guidance, advice, and advocacy. Additionally, networking groups and events specifically for women, like the IST Women in Tech Group or the ITSS Herschel Programme for Women in Technical Leadership, create safe spaces for sharing experiences and fostering professional relationships.

Education and Continuous Learning

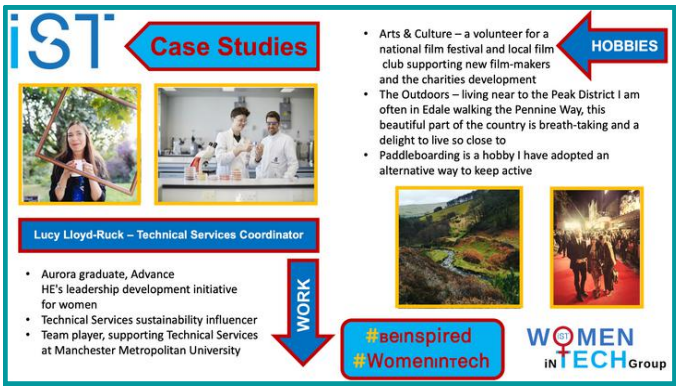
Education serves as the bedrock for empowering women in the technology field. Scholarships and educational programmes tailored for women can break down the financial barriers that often deter them from pursuing tech careers. By providing access to cutting-edge courses and degrees, we can ensure that women are not only well-represented in tech classrooms but also well-equipped to join and innovate in the tech workforce. Continuous learning opportunities, such as workshops, webinars, and online courses, enable women to keep pace with the rapid technological changes and upskill in areas like AI, machine learning, and coding, which are crucial for career progression.

Furthermore, fostering a culture of lifelong learning within the tech industry is essential for continuous development. Companies can support this by offering in-house training programmes, sponsoring conference attendance, or providing time off for educational pursuits. This not only benefits the individual women by enhancing their skill sets and career prospects but also benefits the organisations by creating a more knowledgeable and versatile workforce.

As we move further into 2024, it's imperative that educational initiatives for women in technology are not just available, but are also adaptive, inclusive, and supportive of their long-term career growth.

Inclusive Workplace Cultures

Companies must cultivate inclusive cultures that value diversity. Policies promoting work-life balance, such as flexible working hours and parental leave, can help retain talented women. Anti-discrimination policies and unconscious bias training can create a more equitable workplace.



Visibility and Representation

Seeing is believing. Highlighting the achievements of women in tech through media and at industry events can inspire others and normalise women's presence in tech roles. Representation in leadership positions sends a powerful message that success is attainable. Professor Margaret Ross encouraged the IST Women in Tech Group to create and collect personal/professional profiles so that these could made available to schools to be used to encourage girls into studying STEM subjects. We are keen to continue to received these and anyone interested in generating a profile to add to the collection should contact joanward@istonline.org.uk.

Policy and Advocacy

Policy and advocacy are vital in shaping a tech industry that empowers women. Governments and organisations can lead the charge by enacting policies that create equitable opportunities for women in technology. This includes providing funding for women-led tech

start-ups, which encourages entrepreneurship and innovation. Additionally, advocating for legislation that ensures gender parity in hiring, promotions, and pay can significantly impact the representation of women in tech. These policies should be designed to dismantle systemic barriers and promote a culture of inclusion and fairness in the tech landscape.

On the advocacy front, industry leaders and influencers can amplify the importance of women's contributions to technology. By publicly supporting initiatives that aim to close the gender gap, they can raise awareness and drive change. Advocacy groups can also work to hold companies accountable for their diversity and inclusion metrics, pushing for transparency and continuous improvement. Through persistent and informed advocacy efforts, the tech industry can move towards a future where women's talents and skills are recognised and valued, leading to a more diverse and innovative sector.

Conclusion

The journey towards empowering women in technology is ongoing, but with concerted efforts across education, workplace practices, and policy, we can create an environment where women not only succeed but also lead the charge in technological innovation. As we move through 2024, let us commit to these strategies for success, paving the way for a more diverse and dynamic future in technology.

Hosted by: Lancaster University

IST Technical Conference
10th September 2024

About the Conference

Technicians: Inspiring | Innovating | Creating

The IST Conference, its talks and workshops offer the opportunity for you to update your technical knowledge, skills and advance your career development, providing valuable networking opportunities to engage and learn from the technical community. The event is aimed at anyone who works in a technical position across higher education and industry, working in STEM or ARTS.

IST Members and Groups of 6+	£64
Non-Members	£78
Lancaster Uni Technicians / Staff	No Charge
Accommodation on 9th Sept (Campus)	£65

CONFIRMED KEYNOTE

John Amaechi OBE, FIScT CSci

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2024 Workshop Themes:

- Artificial Intelligence
- Health and Safety
- Environment, Sustainability and Green Technology
- Creative Arts and Media
- Technical Careers

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ABOUT THE CONFERENCE

The unparalleled IST Conference delivers excellent talks, workshops and networking opportunities. The combined package offers delegates a unique opportunity to further their career and professional development by updating technical knowledge and skills. It will also provide invaluable networking opportunities, engaging with and learning from other technical staff and technical supervisors and managers attending the conference. The event is aimed at the **technical workforce** in any industry and sector, from **science** and **engineering** to **creative industries** and **artificial intelligence**.

WHAT PEOPLE SAY:

"I enjoyed meeting like-minded people from other institutions and exchanging ideas and current thinking"

"I really benefit from meeting new suppliers as I prefer to speak directly with representatives and view some of their products"

"The talks were very good, suitable length and the presenters clearly had in depth knowledge of their subjects. Held the interest very well"

"Good range of topics relevant to my role. It was hard to choose just one workshop per session but my colleagues attended different topics so we could share learnings"

IMAGE COMPETITION:

Our image competition is a chance for delegates to share their work experiences in an informal way, to tell a story in pictures and achieve recognition via awards of 1st, 2nd and 3rd prizes.

PREVIOUS CONFERENCES:

TO GET INVOLVED WITH THE CONFERENCE...

Please contact us for more information or if you have any questions

office@istonline.org.uk

Yorkshire Technician Exchange Partnership (YoTEP)

Lucy Hudson, FIScT

An invitation to Yorkshire Universities

Introduction

Technicians from the University of York and University of Leeds successfully bid to the Technician Commitment Collaboration Fund in 2022 to pilot the Yorkshire Technician Exchange Partnership (YoTEP). The aim was to establish a supportive and informative network between the technical communities of the Yorkshire Universities – starting with York and Leeds, but with a plan to expand to include all HEIs in the Yorkshire region in the future.

Our goal: to create an effortless way for technicians working at Leeds and York universities to make contact and arrange an informal visit to learn techniques, to learn how to operate equipment related to teaching and research, to share best practice, and to build a network of support with peers and colleagues.

With funding from the Technician Commitment and support from the highest level at both universities we were able to complete more than twenty-seven exchanges in 2022. New techniques were learned, knowledge shared, and technicians took ownership of new collaborations across science and arts, departments, and schools. Often the exchanges have prompted a wider discussion, and the visit was reciprocated.

If successful, we always intended to expand YoTEP across all Yorkshire universities. With approval to continue to fund and support YoTEP from our VCs, Deans, and our Technician Commitment committees, we would like to invite other Yorkshire universities to be part of YoTEP too.

How It Works

Each university provides a contact name for communications and assistance with finding suitable contacts within their university. The university approves CPD time for the exchange and covers travel expenses.

There are no rules about what the subject of the exchange should be; there have been exchanges for learning an analytical technique, visiting a horticulture facility, learning about cost models for use of equipment, shadowing colleagues in similar disciplines, and for forming a network. There are two routes to creating an exchange:

Finding a pairing - If a technician would like to learn about a particular skill, process or technique, then using university webpages they can find a peer and contact them directly, or through the YoTEP form they can request assistance to find a suitable exchange.

Offering a pairing - If a technician has a skill, knowledge, specialist equipment or facility to showcase, they can complete the YoTEP form making an offer to arrange an exchange.

Feedback From Past Exchanges

"I visited the elemental analysis facility (ICP-OES and ICP-MS) at the School of Earth and Environment, University of Leeds. The shadowing session was helpful to understand the sample preparation techniques, calibration, maintenance needs and to see the instrument in action."

- Green Chemistry Research Technician

"It was a great opportunity to create links and share ideas with people in a similar position. Something which might not have happened otherwise."

- Music & Recording Technology Technician

"My YoTEP visit has had a very positive impact on my research. I learned new techniques and was provided with support and information. The opportunities that the YoTEP programme provides are invaluable."

- Plant Research Technician

"I enjoyed the tour of the facilities in the School of Physics, Engineering and Technology. The tour included the new Engineering Manufacturing Facilities lab… the various student training materials including the logic trainer board, etc. certainly held my attention and I even spotted some familiar bits of kit… In summary, I would be delighted to return to York and learn more about the work that you do should the opportunity arise in the future."

- Engineering Technician

"To visit York and share creative uses of audio technology in a casual setting was great!"

- Music & Recording Technology Technician

"Plant science features in the research portfolio at both York & Leeds. YoTEP has enabled the technical groups at Leeds and York to carry out collaborative investigations into the use of peat free compost. Trials are ongoing."

- Horticulture Facility Technical Manager

We have deliberately kept the process simple and informal to be as inclusive as possible to all technicians regardless of grade or discipline, and we particularly encourage early career and lower grade technicians to take part. Leeds University has allocated administrative time to support the project and manage a dedicated YoTEP email address.

To contact the YoTEP team, please email yotep@leeds.ac.uk

Lucy Hudson & Graeme McAllister
University of York

Angela Beddows & Jennie Hibbard
University of Leeds

Higher Education and Technician Educational Development

www.heated.org.uk

As the summer of 2024 approaches, individuals across various professions and industries are gearing up to enhance their skill sets and knowledge base. In the realm of professional development, HEaTED emerges as a beacon of opportunity, offering an array of courses tailored to meet the evolving needs of learners. HEaTED, short for Higher Education and Technician Educational Development, and now in its 23rd year, is renowned for its commitment to providing high-quality training and development opportunities to technical professionals in science, engineering, and the creative industry fields.

Last autumn, HEaTED partnered with the IST to develop our Technical Leadership Programme, a component of longer, more comprehensive and impactful learning opportunities to develop and create the technical leaders of tomorrow. The programme utilises asynchronous learning with a hybrid teaching style of onsite and online teaching to examine delegate leadership knowledge, skills, and behaviours, thereby enhancing their effectiveness in leading and contributing to strategic change initiatives. Individuals are given the opportunity to enhance their understanding and practice of leadership, while considering how they lead change within their teams, their department and across their institution.

With a rich tapestry of courses designed to cater to diverse interests and career trajectories, HEaTED stands as a premier destination for those seeking to broaden their horizons and stay abreast of the latest advancements in their respective fields. HEaTED courses are approved by the Royal Society of Chemistry and this year we are proud to become an Approved CPD provider by the CPD Certification Service.

Explore your own career development and excel in your technical career with our new Career Development half-day course.

Learn about microscope components, configurations, resolution, and magnification, including brightfield and phase contrast techniques, with hands-on practice time. Supported by the Royal Microscopical Society.

This course will provide participants with essential methods and information to take charge of their own development and identify desirable skills they possess, to assist in planning and achieving their ideal career.

In May 2024 HEaTED organised a dynamic week of events and sessions to help support technicians in Higher Education for Mental Health Week. The National Technician Development Centre (NTDC), host of HEaTED, delivers the unique NTDC Technician Survey, which captures information on every aspect of a technical workforce, from specialist technical skills, to future career plans and development needs. Survey results have shown a need for mental health support for technicians and technical services teams across multiple institutions. Empower your technical workforce with HEaTED Mental Health and Wellbeing CPD learning. Discover how investing in HEaTED CPD courses, crafted by technicians for technicians, can elevate your technical teams by visiting our website www.heated.org.uk.

National Technician Development Centre (NTDC)

www.ntdc.ac.uk

The National Technician Development Centre's Survey Team has recently begun sharing national benchmarking data with organisations that have run the NTDC Technician Survey.

With twenty five organisations having now run the survey, the NTDC has collected responses from thousands of technical staff which feeds into this benchmarking data.

The NTDC Technician Survey captures detailed data about an organisation's technical workforce to help gain a thorough understanding of the skills and experiences held by their staff in alignment with Recommendation 3 of MI TALENT's TALENT Commission Report ("Employers of technical staff should collect, report and analyse data on their technical workforce…") as well as capturing key details of how to better support and develop their technical staff. Each organisation also receives a guide matching the most popular training and development requests amongst their technical workforce to relevant HEaTED training courses, so that organisations can follow-through on effectively supporting and developing their staff. In addition to this, the survey highlights 'at-risk' skill areas, whereby specialist technical skills and responsibilities are predominantly held by staff who are at risk of leaving the university, so that each organisation can put in place effective

and informed workforce and succession planning to ensure that skills are retained.

Each organisation receives an interactive data dashboard, allowing them to quickly and easily cross-reference and filter different elements of their technical workforce, in order to identify and highlight areas of interest or concern.

This comprehensive data-set, in combination with the NTDC's benchmarking data, allows organisations to not only gain an understanding of their own technical services, but also to see how they compare to other organisations.

By sharing interactive benchmarking data, organisations will be able to investigate and interrogate the areas of the data that they are most interested in. Having previously released benchmarking reports looking at the profile of technical staff, and training and development requests, the Survey Team hopes that by sharing wider benchmarking data the NTDC will be able to help participating organisations in sharing findings and best practice when it comes to supporting and developing their technical workforces.

The NTDC have also been using their benchmarking data on a collaborative project with the Higher Education Statistics Agency (HESA). The NTDC and HESA have been comparing the NTDC's technical staff data with HESA's general professional services staff data. This comparison aims to reinforce the proposal that when it comes to University staff data, technical staff should be seen as their own distinct category. The NTDC and HESA hosted a workshop in February for technical leads and managers across the sector to discuss these issues, and the NTDC Survey Team shared a preview of the data and findings at the Technical Managers in Universities (TMU) conference at the end of March.

For anyone wishing to find out more about the NTDC Technician Survey, please reach out to the NTDC Survey Team.

Higher Education

Times Higher Education's Digital Universities UK 2024: This event, hosted in partnership with the University of Exeter, brought together digital and technology leaders from higher education, industry, and policy to discuss academic innovation and technology.The conference emphasized building inclusive digital futures and explored the opportunities and challenges of digital transformation.

Financial Resilience in Higher Education: The sector is facing financial challenges, with a 'broken business model' being a widely used description. The rapid rise in international student fees, which average £22,000, has been unable to compensate for the shortfall in the cost of teaching UK students. The sector is grappling with how to address the declining 'real' value of UK fees.

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Technician Commitment

iST

Supporting the technical workforce in the creative, digital, engineering and science technologies

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SUPPORTING THE TECHNICAL WORKFORCE

We are still accepting expressions of interest to be part of the Editorial Board or to be involved with any of the other IST activities that take place over the year.

Thank You for your contributions

Alex Rutherford, Leeds Children's Hospital
Alistair Field, Insitute of Agriculture
Evelyn Wood, Royal Bank of Scotland
Tim Sandle, Bio Products Laboratory
IST AI Bot, The Internet
Richard Saldanha, IST AI Group
Alicia Colson, IST AI Group
Lucy Hudson, University of York
Joan Ward, Institute of Science & Technology
Terry Croft, Institute of Science & Technology

Many thanks also to:
National Technician Development Centre
HE and Technician Educational Development

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Wanting to contribute to the magazine?

If you are interested in contributing to The Tech Magazine then please email office@istonline.org.uk.

We hope to see you at this years Conference

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