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Surrey in race to capture carbon

A unique carbon capture technology developed by researchers at the University of Surrey could offer a more cost-effective way to remove carbon dioxide (CO_2) from the air and turn it into clean, synthetic fuel.

A study published in Applied Energy demonstrated that the Dual-Function Material (DFM) process – which combines carbon capture and conversion – could match or outperform more established industry methods. Under optimal conditions, it was shown to remove carbon at a cost of US$740 per tonne, with the potential to drop below $400 as materials improve.

Dr Michael Short, Associate Professor of Process Systems Engineering at the University of Surrey and lead author of the study, said:

“For the first time, we’ve been able to demonstrate it can be financially competitive to use DFMs for direct air capture (DAC) – all the while creating clean fuel like methane in the process.

“Using green hydrogen from renewable electricity and carbon from the atmosphere, our system can help to replace fossil feedstocks in sectors like steel manufacturing. If a steel mill uses this fuel, it could effectively have zero net emissions – offering a sustainable path to decarbonise industries that are otherwise hard to electrify.”

Using superstructure optimisation – an advanced modelling technique – the team tested a wide range of configurations to identify the most cost-effective design for capturing 10,000 tonnes of CO_2 per year – a scale comparable to other commercial systems.

With further improvements in material performance and catalyst cost, researchers suggest it could hold promise for large-scale deployment and can be integrated with existing industry infrastructure.

Dr Melis Duyar, Associate Professor in Chemical and Process Engineering at the University of Surrey, said:

“Recycling carbon in this way is a powerful idea, with potential to create many new value chains and enable energy independence by embedding renewable energy into the production of conventional fuels and chemicals.”

The Intergovernmental Panel on Climate Change (IPCC) warns that limiting global warming to 1.5°C will require not only cutting emissions but also removing billions of tonnes of CO_2 from the atmosphere this century.

In the lead up to Net Zero target deadlines, the technology offers a promising and economically viable route to help achieve that goal – while helping us to reduce overreliance on fossil fuels.

Surrey Uni leads microbe recyling of lithium batteries

A microbial electrochemical technology capable of recovering 90-95% of lithium from spent lithium-ion batteries has been developed by scientists at the University of Surrey.

The breakthrough offers a more sustainable and cost-effective alternative to conventional recovery methods and could be expanded to reclaim other valuable battery metals, like cobalt.

Funded by the Biotechnology and Biological Sciences Research Council (BBSRC), the BioElectrochemical LIthium rEcoVEry (BELIEVE) project set out to tackle one of the biggest challenges in lithium-ion battery recycling – reducing the environmental and economic costs.

Professor Claudio Avignone Rossa, Professor of Systems Microbiology at the University of Surrey and principal investigator on the project, said:

“Lithium-ion batteries power so much of our modern technology, from phones to electric vehicles, but current recycling processes remain energy-intensive, costly and inefficient. Our goal was to develop a bioelectrochemical system (BES) that uses microbial electrochemical technology to extract high-purity lithium from used batteries – which is currently very difficult to do.”

Traditional methods recover small amounts of lithium, sometimes as little as 5%, while more advanced techniques achieve higher yields but rely on corrosive chemicals.

Professor Jhuma Sadhukhan, Professor of Engineering and Sustainability at the University of Surrey and co-lead on the project said:

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"This project is timely due to stringent legislation for material security, particularly tech-metals like lithium. With this respect, extraction-precipitation, electrosynthesis and crystallisation have been tried to recover lithium from brines; however, the methods have posed specific challenges, including low recovery of lithium compounds.

"Biotechnology-based biorefining is needed to close the LIB loop and thereby improve product grades and recovery rates, process robustness, social justice, economic returns, health, safety, environment and legislation. In this research, we optimised a biological system to recover high purity lithium from industrial black mass, a used lithium-ion battery material after thermal and mechanical processing, separating aluminium and iron."

Dr Siddharth Gadkari, Lecturer in Chemical Engineering at the University of Surrey and co-lead on the project, said:

"By harnessing specially selected microorganisms to transfer electrons and extract lithium, we have developed a cleaner, more sustainable approach that dramatically reduces reliance on harmful chemicals.

"Our next steps will focus on proposals to expand the technology to recover and separate all valuable metals from batteries, including high-value cobalt, nickel and manganese. While challenging, this is a crucial step toward establishing a truly circular battery economy."

Developing a scalable process that efficiently recovers lithium, cobalt and other valuable metals will not only reduce waste but also lessen dependence on environmentally damaging mining practices.

It also closely aligns with EU Green Deal 2020 regulations, which aim for a 65% recycling efficiency for lithium-ion batteries and a 70% material recovery rate for lithium by 2030. Similar regulations are anticipated in the UK, underscoring the significance of the BELIEVE project's contributions to sustainable technology and resource management.

The team now plans to put forward new proposes to explore how they can recover all metals from lithium-ion batteries.

Surrey Uni Study: long Covid patients proving their illness is real challenges

People living with Long Covid often feel dismissed, disbelieved and unsupported by their healthcare providers, according to a new study from the University of Surrey.

The study, which was published in the Journal of Health Psychology, looked at how patients with Long Covid experience their illness. The study found that many patients feel they have to prove their illness is physical to be taken seriously and, as a result, often reject psychological support, fearing it implies their symptoms are "all in the mind".

Professor Jane Ogden, co-author of the study from the University of Surrey, said:

"We found that the problem isn't people with Long Covid refusing help – it's about the deep need for people to be believed. When a patient feels dismissed, offering psychological support instead of medical care can be misconstrued as insulting."

According to the Office for National Statistics, there are 1.9 million people who live with Long Covid in the UK. Long Covid symptoms include fatigue, difficulty concentrating, muscle aches and shortness of breath, which persist for many weeks, sometimes months, after the initial Covid-19 infection.

Surrey's study involved in-depth interviews with 14 people in the UK between the ages of 27 to 63 who had experienced Long Covid symptoms for more than four weeks. The group included 12 women and 2 men.

Saara Petker, clinical psychologist, co-author of the study and former PhD student at the University of Surrey, said:

"We found that our participants are living a life of constant uncertainty, struggling to find treatment. People told us that they didn't feel listened to, some said they'd lost trust in doctors, their social circles and even their own bodies because of the whole experience.

"Medical advice is crucial – but psychological support must be offered with care. If it's seen as replacing medical help, it can feel dismissive."

Image: License details Creator: Jose Luis Navarro. Copyright: CC BY-SA 4.0

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Surrey leads lateral thinking about vertical farming

Can vertical farming be the key to improving and safeguarding the United Kingdom's food system? This is the central question behind a new research project led by the University that has been awarded £1.4 million by UK Research and Innovation (UKRI).

The Vertical Farming to Improve UK Food System Resilience (VF-UKFSR) project will investigate how vertical farming can improve the country's supply of nutritious leafy greens, essential for a healthy diet.

Vertical farming is a method of growing crops in stacked layers, often indoors, using controlled environments. Unlike traditional farming, it doesn't rely on soil or natural sunlight. It uses soilless techniques and artificial lighting to create optimal conditions for plant growth. This allows crops to be grown year-round, regardless of weather conditions and makes more efficient use of space and resources.

Dr Zoe M Harris, project lead from the University of Surrey's Centre for Environment and Sustainability, said:

"Our project is keen to explore how vertical farming can provide local, diverse, and culturally appropriate food, given its potential to grow a wide variety of crops. So far, there's been little in-depth analysis of the risks to our country's leafy greens supply nor a thorough examination of the benefits and trade-offs vertical farming could bring to the UK's food system. Thanks to this grant from UKRI, we're excited to change that and create a clear roadmap to unlock this potential on a larger scale."

The research team will work closely with farmers, industry, government and the community to make sure that the outputs of the project focus on real-life and immediate benefits.

The core team is made up of whole-system, environmental and social scientists, UK Urban AgriTech (UKUAT) and five farm partners – Flex Farming, Innovation Agritech Group, Farm Urban, GrowPura, and LettUs Grow.

Dr Lada Timotijevic from the University of Surrey said:

"Our research is all about identifying and understanding the risks to our food system and seeing how vertical farming can help tackle these challenges. We want to create tools that make it easy to see the impact of expanding vertical farming on considerations including food supply, land use, and the environment, so we can make smart decisions for the future.

"We're also focused on understanding the public's perceptions of vertical farming and the social conditions needed for vertical farming to succeed, as well as on working closely with farmers, industry, and policymakers to build a roadmap that supports its growth across the UK."

The project's leadership team consists of:

- University of Surrey: Dr Zoe M Harris, Dr Lada Timotijevic, Dr Lirong Liu, Dr James Suckling, Dr Damiete Emmanuel-Yusuf
- University of Aberdeen: Professor Astley Hastings
- University of Sussex: Dr Alexandra Penn
- UKUAT: Mark Horler

Image: Vertical farm. Credit ifarm.fi Creative Commons Attribution-Share Alike 4.0 International

Surrey University boldy go to the next galaxy

A collaboration of more than 30 international institutions, including the University of Surrey, has observed vast differences in the dynamic ecosystem of smaller satellite galaxies orbiting our neighbour galaxy, Andromeda. Surveyed using images from over 1,000 Hubble Space Telescope orbits, the findings have given scientists new insights into the evolution of galactic systems.

The study, published in The Astrophysical Journal, found that Andromeda's satellite system is notably different from our own Milky Way, 2.5 million lightyears apart. While both galaxies are surrounded by a flotilla of smaller dwarf galaxies, Andromeda

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likely hosts three times as many – offering a rare glimpse into their unique history and formation.

Dr Michelle Collins, Associate Professor at the University of Surrey's School of Mathematics and Physics and co-author of the study, said:

"What we've discovered is that these tiny systems have evolved quite differently from those around the Milky Way. Whether this divergence stems from a massive merger – a slow, gradual collision in Andromeda a few billion years ago – or whether it reflects the natural diversity of the smallest galaxies remains a mystery we're working to unravel."

One of the study's key themes is how Andromeda's dwarf galaxies have formed and sustained stars in unexpected ways compared to those around the Milky Way. Researchers had long assumed low-mass galaxies would follow similar patterns, but the Andromeda system tells a different story. These satellite galaxies appear to have experienced a more complex evolutionary history, with some continuing to form stars far longer than anticipated.

Lead author of the study, Dr Alessandro Savino, from the University of California, Berkeley, said:

"Star formation really continued to much later times, which is not at all what you would expect for these dwarf galaxies. This doesn't appear in computer simulations. No one knows what to make of that so far."

To explore these differences more closely, researchers at the University of Surrey are working to understand the forces driving these unexpected evolutionary patterns. A follow-up study will investigate the mass profiles and dark matter distribution of Andromeda's satellite galaxies, integrating data from this paper with new observational measurements.

Dr Collins, who will lead the research, said:

"We've established that there are clear differences, but what I'm really interested in now is why these differences exist. What factors have shaped Andromeda's satellites in ways we don't see in the Milky Way?"

Combining the latest Hubble data with ongoing studies at Surrey, the team plans to gain a deeper understanding of the mechanisms shaping galaxies across the universe. Additionally, Hubble is providing the first set of imaging that allows astronomers to measure the motions of Andromeda's dwarf galaxies – offering a rare opportunity to track their movements and reconstruct their past interactions.

To find out more, visit the Space Telescope Science Institute's news page.

Image credit: NASA, ESA, Alessandro Savino (UC Berkeley), Joseph DePasquale (STScI), Akira Fujii DSS2

Surrey leading the shout: "Keep the noise down will you!"

An interdisciplinary network of engineers, policymakers, industry stakeholders and social scientists, led by the University of Surrey, will take on one of the UK's most overlooked environmental challenges: noise pollution.

From the constant hum of road traffic to the thousands of flights in and out of UK airports, noise awareness in our modern world often fades into the background – but it carries significant consequences for both human health and wildlife. Noise Network Plus will focus on promoting conscious design processes to create quieter products, buildings and transportation systems – with the aim of reducing noise pollution and building a healthier environment over the next 10-15 years.

Professor Mark Plumbley, project lead and Professor of Signal Processing at the University of Surrey's Centre for Vision, Speech and Signal Processing (CVSSP), said:

"Noise is a frequently neglected pollutant, but it has a big impact on health, society and the environment. For example, road noise can lead to sleep disturbance and heart disease, costing £7-10 billion each year in England alone. Once noise is out there, it is really hard to remove. We need to re-think how we design noise from the start."

Awarded more than £1.8 million in funding, Noise Network Plus is one of six research projects to receive a share of £10 million from the Engineering and Physical Sciences Research Council (EPSRC). Together they form part of its wider community engagement initiative to address 'Tomorrow's Engineering Research Challenges' (TERC), launched today (11th February), which focuses on tackling the most pressing issues facing the engineering sector.

Professor Abigail Bristow from the University of Surrey, said:

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“We’re at a pivotal moment in time where our environment is under threat, but we have the technology and expertise to make meaningful changes. Our mission-oriented research and innovation network will look to adopt a systems-thinking approach, addressing the root causes of noise and understanding its far-reaching impacts.”

A collaboration between the University of Surrey, City St George’s University of London, the University of Bath, and the University of Salford, Noise Network Plus aims to build unprecedented research capabilities to tackle the complex challenge of reducing noise and its impacts on people, the environment and the economy. Bringing together diverse teams and stakeholders, the initiative will promote inclusive dialogue and co-design innovative solutions.

Alan Hunter, Professor in Autonomous Systems based in the University of Bath’s Department of Mechanical Engineering, will lead the network’s efforts on underwater noise and artificial intelligence. This will include research into the effects of noise created by human activities at sea and improving the resilience of uncrewed underwater vehicles to noise. Professor Hunter said:

“The ocean is a noisy place, and a lot of the tools and technologies we rely on to deliver services either increase noise levels or are affected by noise. Taking oceanographic measurements, measuring marine wildlife populations, or inspecting underwater infrastructure, are all examples of activities affected by noise and of which we need to build a better understanding.”

Professor Antonio Torija Martinez and Dr Simone Graetzer are co-leads on the project at the University of Salford’s Acoustic Research Centre. Professor Martinez said:

“As the UK moves toward Net Zero, the adoption of sustainable energy and emerging technologies – such as wind turbines and drones – will introduce new sources of noise, fundamentally reshaping our soundscapes. This offers us a unique opportunity for a fresh start and through our initiative, we aim to transform the way noise is managed, embedding innovative solutions into engineering design and policy.”

Professor Charlotte Clark, Professor of Environmental Epidemiology in the Population Health Research Institute at City St George’s, University of London, said:

“This is a rare and timely opportunity to form multidisciplinary and interdisciplinary teams to develop engineering solutions addressing the problem of noise effects on health. We know that noise affects health, but we know little about how to mitigate the problem. The missions developed in the Noise Network Plus have the potential to step up mitigation efforts that will translate into major, long-term public health gains.”

The launch of Noise Network Plus will take place on 18th March at Prince Philip House, the home of the Royal Academy of Engineering, in London. The event will bring together a cross-section of people from engineering and other disciplines including researchers, industry, professional institutions, policymakers, charities, and other stakeholders, to identify the challenges that need to be addressed, and plan how the Network can work to address these challenges.

Professor Adrian Hilton, Director of the Surrey Insititute for People-Centred AI and CVSSP, added:

“Noise Network Plus represents a significant step towards addressing an often-overlooked pollutant and its detrimental impact on people. This interdisciplinary people-centred approach aims to tackle the complex challenges of noise in our modern world and develop innovative solutions for quieter and healthier communities.”

Surrey Uni leads research to replace plastic with paper for liquids

A multimillion-pound research project, called SustaPack, aims to overcome manufacturing challenges for the next generation of sustainable, paper-based packaging for liquids. Backed by a £1 million grant from the Engineering and Physical Sciences Research Council (EPSRC) as part of UKRI’s co-investing programme, packaging technology company Pulpex Ltd has joined forces with the University of Surrey to refine its manufacturing processes to provide a viable solution to plastic pollution.

Contributing matching support towards the project, Pulpex has already made significant strides in the development of its patented technology, which produces degradable bottles made from natural wood fibres. The packaging offers a sustainable alternative to traditional plastic materials and can be recycled in existing paper waste streams.

However, designing the next generation of production technology and materials requires novel and fundamental research to address current limitations, including new analytical techniques to improve product quality, optimising performance and reducing

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in-process imperfections.

Scott Winston, CEO at Pulpex, said:

“We’re excited to strengthen our existing collaboration with the University of Surrey to enhance our technologies and processes. Our SustaPack partnership will help us advance safe, sustainable packaging solutions, enabling brand owners to meet Net-Zero targets. It gives consumers sustainable choices, delivers answers for brand owners, and enables supply chains and retailers to deliver their carbon footprint reduction goals – a priority for all.”

A key feature of the packaging is its multi-layered barrier coating, which prevents contained liquid from leaking, as well as inward oxygen permeation, maintaining high-quality products for consumers. To create a step-change in the energy usage in methods used to apply these coatings, the researchers plan to develop innovative processes that consume less energy and water while increasing the shelf life of packaged goods.

Professor Joseph Keddie, from the University of Surrey’s School of Mathematics and Physics, and Fellow of the Institute for Sustainability, said:

“Over the past couple of years, I have forged a close relationship with Pulpex as a Royal Society Industry Fellow, and I am enthusiastic about strengthening our ties through our SustaPack Partnership.

“Our aim here is to combine novel coating processes, mechanistic modelling, computer vision and artificial intelligence (AI) to establish a ‘dry’ spray coating process that deposits food-safe, degradable coatings. This technology, which isn’t yet commercially available, will not only drive the next generation of packaging technology but will also contribute to a significant reduction in plastic pollution and lower carbon emissions from manufacturing.”

A multi-disciplinary team of researchers will explore the feasibility of using thermal imaging to detect defects in wet coatings as they occur, enabling immediate corrections using AI. Multi-scale mechanistic models of the coating process will be employed to identify the sources of imperfections and non-uniformities and then eliminate them to ensure optimal packaging performance.

By applying innovative computer vision techniques powered by AI, the project aims to identify production defects in real-time, optimise materials and processes, and achieve 100% reliability in the manufactured products.

The outcomes of the project could set new standards for environmentally friendly packaging, helping brand owners reduce their environmental impact amidst ever-increasing environmental regulations – while offering consumers eco-friendly options to help fight against plastic pollution.

From left to right: Dr Hui Luo and Professor Robert Dorey (University of Surrey’s School of Engineering); Professor Joseph Keddie (University of Surrey’s School of Mathematics and Physics); Scott Winston, CEO at Pulpex; Barrie Harvey, COO at Pulpex; Dr Simon Hadfield (University of Surrey’s Centre for Vision, Speech and Signal Processing); Professor Charley Wu (University of Surrey’s School of Chemistry and Chemical Engineering).

Surrey Uni making self-driving cars safer

With self-driving cars expected to hit British roads next year (2026), a new motion forecasting framework developed by the University of Surrey and Fudan University, China, promises to make autonomous cars both safer and smarter.

Researchers have combined their expertise to create RealMotion – a novel training system that seamlessly integrates historical and real-time scene data with contextual and time-based information, paving the way for more efficient and reliable autonomous vehicle technology.

Dr Xiatian Zhu, senior lecturer at the Centre for Vision, Speech and Signal Processing and the Insitute for People-Centred AI at the University of Surrey and co-author of the study, said:

“Driverless cars are no longer a futuristic dream. Robotaxis are already operating in parts of the USA and China, and self-driving vehicles are expected to be on UK roads as early as next year. However, the real question on everyone’s mind is: how safe are they?

“While AI operates differently from human drivers, there are still challenges to overcome. That’s why we developed RealMotion – to equip the algorithm with not only real-time data but also the ability to integrate historical context in space and time, enabling more accurate and reliable decision-making for safer autonomous navigation.”

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Existing motion forecasting methods typically process each driving scene independently, overlooking the interconnected nature of past and present contexts in continuous driving scenarios. This limitation hinders the ability to accurately predict the behaviours of surrounding vehicles, pedestrians and other agents in ever-changing environments.

In contrast, RealMotion creates a clearer understanding of different driving scenes. Integrating past and present data enhances the prediction of future movements, addressing the inherent complexity of forecasting multiple agents' movements.

Extensive experiments conducted using the Argoverse dataset, a leading benchmark in autonomous driving research, highlight RealMotion's accuracy and performance. Compared to other AI models, the framework achieved an 8.60% improvement in Final Displacement Error (FDE) – which is the distance between the predicted final destination and the true final destination. It also demonstrated significant reductions in computational latency, making it highly suitable for real-time applications.

Professor Adrian Hilton, Director of the Surrey Institute for People-Centred AI, said:

"With self-driving cars reaching British roads imminently, ensuring people's safety is paramount. The development of RealMotion by Dr Zhu and his team offers a significant advance on existing methods. By equipping autonomous vehicles to perceive their surroundings in real-time, and also leverage historical context to make informed decisions, RealMotion paves the way for safer and more intelligent navigation of our roads."

While researchers encountered some limitations, the team plans to continue its research to further improve RealMotion's capabilities and overcome any challenges. The framework has the potential to play a critical role in shaping the next generation of autonomous vehicles, ensuring safer and more intelligent navigation systems for the future.

About the Surrey Institute for People-Centred AI (PAI)

Taking a different approach to much AI activity in the UK, the Surrey Institute for People-Centred AI puts the needs of individuals and society at the very heart of everything it does: we believe that the starting point for AI should be people rather than technology.

This people-centred approach drives our research and enables us to design AI technologies and systems that are ethical, responsible, and inclusive. The pan-University Institute brings together Surrey's core AI-related expertise in vision, speech and signal processing, computer science, and mathematics, with its domain expertise across engineering and physical sciences, human and animal health, law and regulation, business, finance and the arts and social sciences. With this distinctive approach, PAI builds on Surrey's track record of collaboration with industry, the public sector, government and other relevant institutions to develop solutions to shared challenges.

Image: Waymo self-driving vehicle. Credit Grendelkhan CC by SA 4

Surrey Uni to lead on speech to sign GBT computer programme

A large-language model (LLM) built to meet the needs of the Deaf community, translating between signed and spoken language, is the aim of a new project led by the University of Surrey.

SignGPT: Building Generative Predictive Transformers for Sign Language has been awarded £8.45m from the UK Engineering & Physical Sciences Research Council. The five-year project will build tools to allow spoken language to be automatically translated into photo-realistic sign language and video of sign language to be translated into spoken language – a complex translation problem that is yet to be solved.

Surrey will work alongside the University of Oxford, the Deafness Cognition and the Language Research Centre at University College London, key Deaf stakeholders, and the Deaf community.

Professor Richard Bowden, Principal Investigator of the project from the University of Surrey's Institute for People-Centred AI, said:

"Large language models such as those behind ChatGPT and Gemini are transforming many aspects of our personal and working lives – and that transformation is happening at a blistering pace. Our project, SignGPT, is not about replacing humans, but it is about ensuring the Deaf community is not left behind in this revolution.

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“By creating technology that serves the community, we’re enabling equal access to information, working towards seamless communication between the Deaf and hearing world, and demonstrating that AI can be a tool for inclusivity and empowerment. SignGPT isn’t just about accessibility for Deaf people – it’s about setting a standard for how innovation can address inequities, strengthen human connection, and build a more inclusive society. In a world shaped by rapid technological change, projects like this show that AI’s potential is greatest when it uplifts everyone.”

Globally, there are around 70 million Deaf or hard-of-hearing individuals, many of whom use sign language as their primary form of communication. For many, written/spoken languages serve as a second or third language, and proficiency in these languages can vary. There is no universal sign language: sign languages are natural human languages created over centuries by Deaf communities and are not derived from spoken languages. Their underlying rules and structures remain a rich area of linguistic study. Each sign language has its own unique grammar and lexicon, relying on both manual gestures (hands) and non-manual expressions (body and face), along with spatial elements, to convey meaning.

Professor Bencie Woll, sign linguist, co-investigator of the project, and founder of the Deafness Cognition and Language Research Centre at UCL, said:

“This project is a unique collaboration between vision scientists and sign linguists with Deaf and hearing researchers working together towards our common goals.”

Mark Wheatley, CEO of the Royal Association for Deaf People (RAD), said:

“I am pleased that this important grant will empower the Deaf community to have further equal access by harnessing AI and large language models. We will ensure that the University of Surrey, Oxford University, and the Deafness Cognition and Language Research Centre at UCL, alongside Deaf-led stakeholders such as RAD, take a people-centred approach to ensuring ethical responsibility and the accuracy of translations so that we, the Deaf community, can use them for everyday purposes.”

Professor Kearsy Cormier, one of the Co-Investigators on the project from University College London, said:

“So much work in sign language technology is undertaken by researchers with no understanding of how sign languages work, nor any lived experience of deafness themselves. This project will allow real co-creation/co-development of this technology with Deaf and hearing researchers in linguistics and deaf studies working alongside computer vision specialists – with each group learning from each other – and, importantly, building capacity amongst Deaf researchers so they may lead this field in the future.”

SignGPT’s research team will produce the largest sign language dataset in the world and use it to build a sign language LLM that can provide the breadth of application to the Deaf community that current LLMs provide for written/spoken languages. In doing so, the project will also generate tools for data annotation that will be released for use by the wider community. The project already has Deaf members within both the research team and wider partners, but it is hoping to recruit more staff for whom British Sign Language is their primary language.

The challenge of automatically translating between sign languages and spoken languages is highly complex and remains unsolved. SignGPT will produce open-source toolkits for linguistic use, web-based demonstrations for accessible knowledge exchange and run outreach programmes alongside collaborative workshops.

Surrey University leading on alternative ADHD treatment

A multisite clinical trial has launched in the United States to investigate whether non-pharmaceutical methods can be used to treat attention deficit hyperactivity disorder (ADHD) in children ages 7-12. This trial is currently recruiting new patients and seeking FDA clearance.

The trial uses a wearable device – Novostim 2 – developed by Innosphere Engineering Ltd. The company anticipates FDA clearance by Q3 of 2025 and has already received approval for sales in Israel.

The novel treatment builds upon years of research into non-invasive brain stimulation techniques led by the University of Surrey’s Professor Roi Cohen Kadosh. The research team carried out multiple studies in which children with ADHD were treated with transcranial Random Noise Stimulation (tRNS) coupled with cognitive training (CT).

tRNS is a non-invasive technique that delivers a weak and painless electrical signal to the brain to enhance activity in regions

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associated with attention. In the studies, children who received tRNS and CT experienced significant improvements in their ADHD symptoms, working memory, and processing speed, along with changes in their brain activity, which could be linked to the improvement of their symptoms in the long-term.

Two clinical trials have been completed using Novostim 2 at Hadassah Medical Center in children aged 7-12, which showed significant improvement in ADHD symptoms, including a 43% reduction in ADHD symptom severity and overall symptom alleviation.

The trial, over a two-week period, involves 20-minute treatment sessions in which Novostim 2 is used to deliver tRNS over specific regions in the brain associated with ADHD and during which participants engage in attention-based digital games.

For more information on the latest trial, visit ADHDtrial.com

Professor Roi Cohen Kadosh, Head of the School of Psychology at the University of Surrey, said:

“We were thrilled by the success of the previous clinical trials, which brought us one step closer to providing a safe and effective non-pharmaceutical option for children with ADHD. The device’s ability to modulate brain activity and enhance cognitive functions may hold the key to long-lasting benefits, potentially reshaping the landscape of ADHD treatment. By harnessing the power of psychology, neuroscience, and technology, we can empower young patients to improve their focus, attention and overall wellbeing. The need continues to grow, and I hope to see this technology become available to many children and their families soon.”

Rami Shacour, co-Founder and CEO of Innosphere, adds:

“For decades, stimulant medications have been the cornerstone of ADHD treatment. At Innosphere, we’re parents first, driven by a mission to give families more personalized, effective options for their children. With Novostim 2, we’re redefining what’s possible in ADHD care. We’re thrilled to announce sales approval in Israel and eagerly anticipate FDA clearance this year. This is just the beginning, as we explore Novostim 2’s potential to complement existing therapies and transform lives.”

Image: Professor **Roi Cohen Kadosh**