The Institution of Engineering and Technology

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Events **Newsletter**

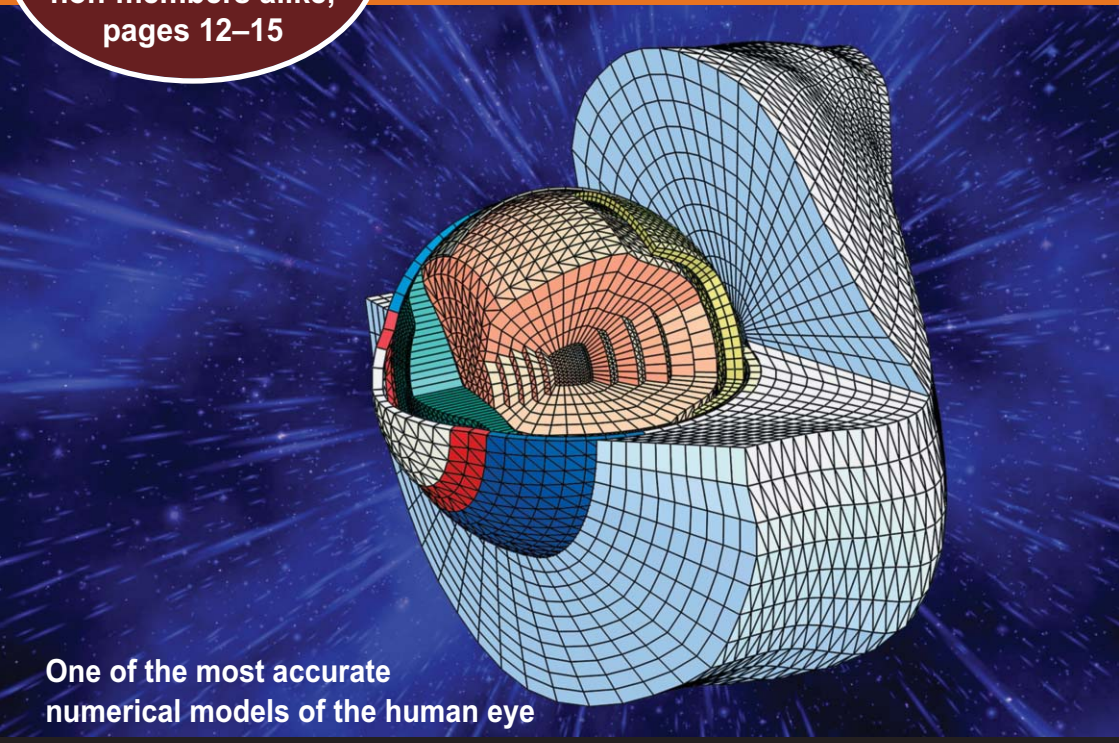
Mersey and Western Cheshire Network including the Isle of Man

January 2022 – September 2022

All our events are free to attend for IET members and non-members alike, pages 12–15

Advancements in Biomedical Engineering

Webinar, 16th March 2022



One of the most accurate numerical models of the human eye

Welcome to our face-to-face events and webinars!

Friends of the Network

The Mersey and Western Cheshire Local Network is run by volunteers, who each year arrange free-to-attend lectures, technical visits, workshops, and annual dinners.

These activities would not be possible without the support of our Friends of the Network. These organisations support the Local Network in many different ways, from sponsorship of the local network, taking advertisements in the two events newsletters that are published each year, taking tables at our Annual Dinners, funding places at our Annual Dinners for young engineers, providing speakers for lectures and allowing technical visits to their factories, engineering offices and academic institutions. Without their help and support, it would not be possible to run the high-quality events that we strive to deliver.

We are grateful for the support given both in the past and going forward into the future by our Friends of the Network.

Thank You for Your Support!

Chair's Message

In my first message as your new Network Chair, I would have liked to be able to say that I have met some of you and enjoyed some excellent events. Unfortunately, the restrictions on face-to-face meetings have continued, meaning that the Internet and all things digital have really had to be embraced.

There have been some excellent events run online, by most of our groups, with the distinct advantage for attendances being possible without travel – from anywhere in the world! This has certainly opened up our Network's activities and has also given many of us a much larger circle of contacts.

The events planned for 2022 are all "hoped" to be live and in person but, we must all be prepared to 'adapt' again if restrictions continue. So, we have contingencies to revert to online webinars for the events that are detailed in this edition of our great Newsletter.

You will read brief reports on the events that have most recently completed – and realise what you have missed. This will, I hope, encourage more of you to come along to these sessions and to network with your peers!

For those of you who are in the furthest reaches of our region – and beyond – we have plans to move to 'hybrid' events once we are able to meet. This will mean that those that simply cannot get there will be able to attend (and participate) remotely.

Watch this space!

I take this opportunity to thank all Volunteers, Presenters, Industrial Partners and Sponsors for your continued efforts and support…

…and ask those IET Members that are not involved – WHY NOT?

Please contact any of us (details at the back of this newsletter) and help make a difference.

Godfrey Evans
Local Network Chair

Deputy Chair's Message

Hello everyone – I'm delighted to be working with Godfrey, and the great Local Network team, as your new Deputy Chair. I do not see my role as simply a stand-in if Godfrey isn't able to make a meeting. Whilst I looked forward to retiring from my position as Dean of Science and Engineering, at the University of Chester it wasn't long before I realised that I really missed working with students – undergraduates, postgraduates and mature students alike - as well as our younger members of staff, some of whom were enjoying their first lecturing post. I am therefore really happy that I will be working with our IET Young Professionals Group in the guise of Mentor and Advisor. I've had a long career in Computer Science - since 1968 - and have the knocks and scars to remind me of the times when I didn't get it right. Hopefully I can pass on some of that knowledge and perhaps help you evade one or two of those knocks. I'm here to help, and my email address is in the back of this newsletter. I'm looking forward to meeting you all – in the 'real' world, soon.

Garfield J. Southall
Local Network Deputy Chair

Contents

Mersey and Western Cheshire Network

Where Do Engineers Come from?

All of the 'active' members and volunteers within the Mersey & Western Cheshire Local Network are aware of the excellent work that has been done for many years by our Education Officers. Unfortunately, there are only two at the moment.

Education Officers and STEM Ambassadors are our Institution's direct connection to schools and colleges – and it is this contact that will help encourage the next generation(s) of Engineers and Technicians that the country really need in all areas of Engineering.

For that to happen we must create a stronger Education Officers Group to reach out to more Schools and Colleges in the region.

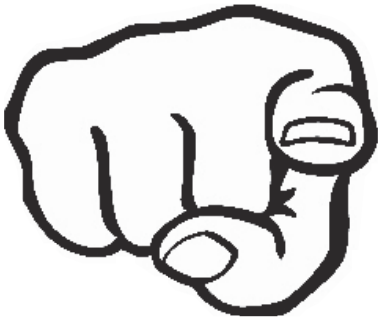
YOUR NETWORK NEEDS YOU!

But, more importantly,

YOUR COUNTRY NEEDS YOU!

This is simply because, without Engineers we ***will*** become a Nation of Shopkeepers!

This is our message to all those Engineers and STEM professionals, in our Network, to step up and help reach as many of the 100s of schools and colleges in our region as possible.



So that we can create a solid foundation to this, we have set out ambitious mission and vision statements of what success could look like in 12 months time.

Mission Statement

The IET M&WC Education team works with Schools and Colleges to promote the values of the IET, encourage students to consider a career within STEM, work with teachers to improve learning experiences *and inspire the next generation of Engineers.*

Vision Statement

The IET M&WC Education team will become the 'model' for all IET Local Networks. It will create and promote a sustainable and consistent relationship with as many Schools and Colleges in the region as practicable, provide sufficient education officers across our region, ample resources to aid STEM curriculum and by working with All About STEM reach schools in need of assistance.

GET INVOLVED!
JOIN THE EDUCATION OFFICERS GROUP!
PROMOTE ENGINEERING TO YOUNG PEOPLE!

Godfrey Evans

Energy and Environment Group

Report on the Energy and Environment Group

The Energy and Environment Group was formed at the end of 2019. It is the successor group to the very successful Power Group led by Bob Green and John Bullock over many years. With the ever-increasing link between energy and the environment, the new group has tried to cover a broad range of related topics. The focus of the Energy and Environment Group are in the following areas:

- The advanced control of energy systems (ACES)
- The generation of electricity using low carbon technologies or with carbon capture.
- The transformation, distribution, and storage of electricity.
- The issues of environmental impact and mitigation of the generation, transmission, distribution, and utilisation of electricity.
- The use of hydrogen in the energy supply system including hydrogen generation, storage, and distribution.
- Greenhouse gas emission reduction including carbon capture technologies.
- The use of energy in transport systems.

The start of the new group, which has eight members, also coincided with the start of the Covid-19 pandemic. The pandemic has curtailed our plans for face-to-face events of lectures and technical visits. As with many organisations we could not run face-to-face meetings or events, so we moved online. Our group meetings have been held on Teams and our lecture events have become Zoom webinars. Our webinar lecture events can be viewed on the IET Mersey and Western Cheshire YouTube channel. Search on YouTube using "IET Mersey and Western Cheshire" to find the channel.

In 2022, we are planning to run more Zoom webinars, and when able run face-to-face events. We hope to develop the means to run hybrid events, so that events can be attended in person and online. If you would like to propose a future event or to join the group, please find the group's contact details in the Key Contacts table on page 26 of this newsletter.

Rob McDonald

STFC Daresbury Tour

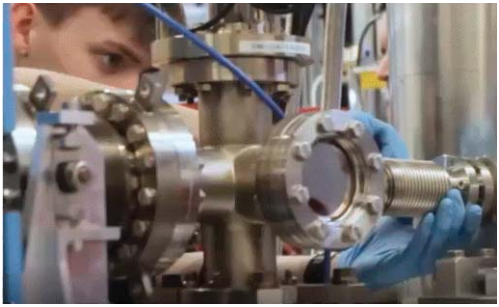
On 29th September 2021, the Young Professionals Group, in partnership with Science and Technology Facilities Council, held a virtual tour entitled “An Apprentice’s Guide to STFC Daresbury Laboratory”.

The aim of the event was to showcase the work done by members of the Young Professionals Network at STFC and allow for a unique perspective of the Laboratory. Before the pandemic, site tours were regular and offered young professionals the opportunity to look into the engineering and technology behind Particle Accelerators.

A LINAC Warm Unit (LWU) for the European Spallation Source (ESS) in Lund, Sweden. This will be the world's most powerful Neutron Source. Credit STFC

Apprenticeship Scheme co-ordinator Jonathan Aghanian opened the webinar with an introduction to the history of the laboratory and details regarding the apprenticeship scheme.

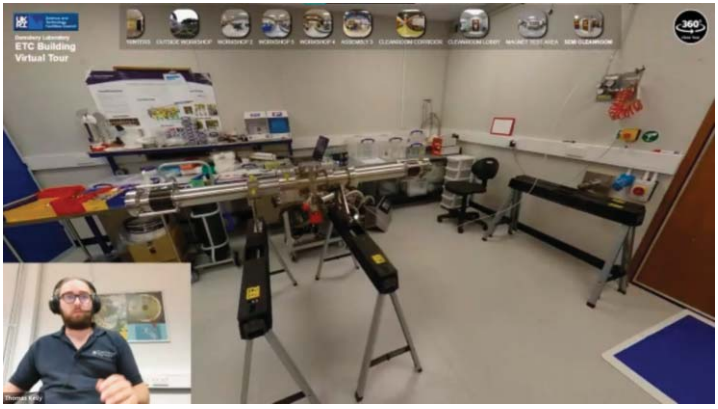
Hosted by Alex Headspith and Tom Kelly, both former apprentices working in the Mechanical and Electrical groups respectively, the tour featured a virtual 360 degree flythrough of the Engineering Technology Centre (ETC). This captured a range of highly technical and specialist work carried out within the laboratory, such as the Precision Machining Centre, ISO 4 Cleanrooms, the main assembly area and the Vacuum Solutions and Processing Laboratory – providing an insight into the work behind the manufacture of Particle Accelerator technologies.



Alex Headspith, a STFC technician installing a new test superconducting undulator onto the CLARA accelerator at Daresbury Laboratory. Credit STFC

Current apprentices Daniel Cresswell (Y4 Mechanical), Jordan Rigby (Y4 Mechanical) and Edward Webber (Y4 Electrical) provided a live feed to the lab through the use of first person camera technology to allow for a closer look into the specific work undertaken by apprentices. This included an in depth viewing of the new Additive Manufacturing equipment, a look at Yttrium Aluminium Garnet (YAG) diagnostic equipment on the STFC accelerator CLARA (Compact Linear Accelerator for Research Applications) and the electromagnet testing process.

Utilising RealWear headsets and Zoom allowed for the first person walkthrough – adopting new technology which was originally sourced to allow for communication into cleanrooms whilst preventing potential contamination that could occur through unnecessary transitions. During the pandemic, they have been used additionally to provide communication from site to those working from home, and provide continued outreach to promote STEM careers.



STFC electrical technician Tom Kelly discussing the uses of Cleanrooms for the assembly of Accelerators requiring strict particle levels. Credit STFC

Thank you to all who attended. A video recording of the webinar is available to view on the IET Mersey and Western Cheshire YouTube channel. If you are interested in joining the group, please contact: alex.headspith@ietvolunteer.org.

Alex Headspith

Industrial Decarbonisation: The Case for the Northwest

On Tuesday 21st September 2021, Professor Joe Howe, Executive Director of the Energy Research Institute, University of Chester gave a Zoom webinar on the topic of "Industrial Decarbonisation: The Case for the Northwest". Professor Howe introduced the Hydrogen Alliance, a group of different companies across the Northwest, promoting the Northwest as the place to take advantage of the emerging energy propositions. Professor Howe is the Chair of the Hydrogen Alliance.

Professor Howe explained that the energy flow chart for the UK in 2019 showed that 80% of UK energy came from oil and gas non-renewables and hence the UK is a long way from Net Zero. The energy inputs to the UK electrical system were 47% from petroleum, 29% from gas, 17% from electricity. Over a year, a substantial amount of electricity is generated from combined cycle gas turbine power plants, so there is a long way to go to meet the UK Statutory Net Zero obligation by 2050.

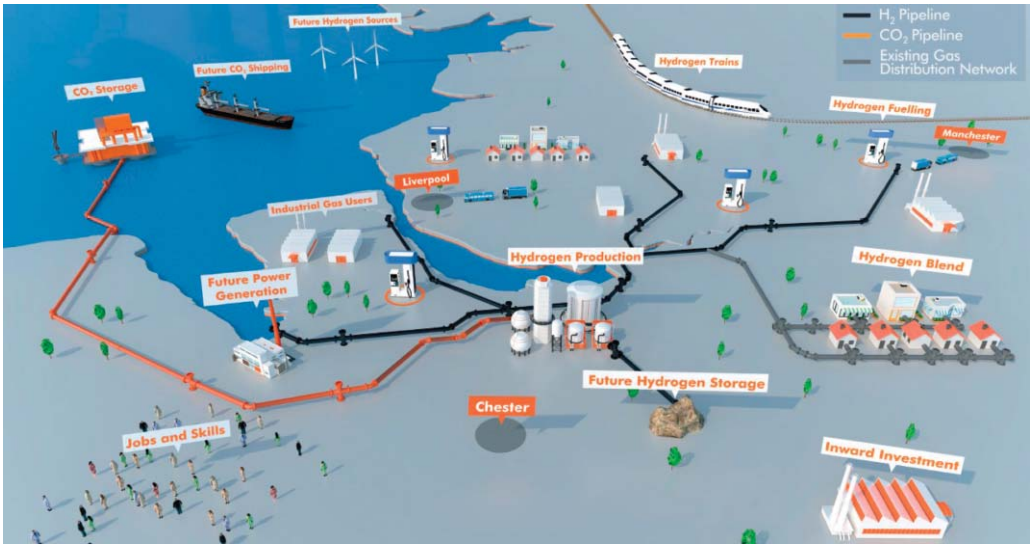
The energy-intensive industries are vital to UK PLC, contributing 8% of the UK economy, £140 bn of Gross Value Added (GVA), employing many people with good salaries but they contribute to 25% of UK emissions. Therefore, the decarbonisation of the energy intensive industries is important. On the Net Zero journey, since 1990 to 2015, the UK has reduced its carbon dioxide emissions by 33%, but consumption by only 4% so we are exporting our greenhouse gas emissions to overseas, but still consuming the same amount of carbon as we were in the early 1990s.

The UK Clean Growth Strategy was published around three years ago, articulated in the document "What is the Industrial Clusters mission?" The document tells us where the main industrial clusters are, with the largest industrial clusters by emission measured in MtCO2 being Humberside, South Wales, Grangemouth, Teesside, Merseyside, and Southampton. The challenge is to decarbonise the industrial clusters.

The Merseyside industrial cluster stretches along the banks of the River Mersey from Ellesmere Port, including the Stanlow oil refinery, to Runcorn and beyond. In Runcorn, Viridor has the largest energy from waste plant in Europe and Ineos has a chlorine electrolysis plant. At Rocksavage, there is a large gas fired combined cycle power plant. In the Northwich area there are salt caverns that are used to store natural gas. Urenco at Capenhurst is the largest uranium enrichment plant in Europe. The Government is encouraging us to think about the mechanisms to decarbonise our industrial clusters, with the Government's 10-point plan, Build Back Better, a green recovery from the Covid pandemic. The Climate Change Act put into law the requirement for the UK to be carbon neutral by 2050.

The UK's Hydrogen Strategy looks to hydrogen as a future source of heat, fuel for transport and energy for industry. The Government have issued a number of consultation documents on the topic of hydrogen. It may be rather than looking at a flowchart of energy flows in the future we will be considering carbon flows.

Professor Howe believes that HyNet is the leading UK's or at least the Northwest's anchor project for industrial decarbonisation. The Government is going through a sequencing review of which of the industrial clusters should go through decarbonisation. The HyNet project covers the geographical area from Northwest Wales, extending north to Saint Helens and Liverpool, and into Mid-Cheshire, with hydrogen production in North Cheshire



Energy and Environment Group

with hydrogen distributed into the Cadent gas network through a blending site.

Hydrogen production will be based in North Cheshire using an autothermal reforming process combined with carbon capture and storage, moving the carbon into the east Irish Sea gas fields as carbon dioxide. HyNet will begin producing low carbon hydrogen from mid-2020s and by 2030, it will produce 4 GW of hydrogen. This would be 80% of the Government's target of 5 GW of hydrogen by 2030 if HyNet is approved. The HyNet project will increase the skill base and jobs in the area and beyond over time. A broad range of skill and education levels will be needed for the production of hydrogen and carbon capture and storage, and this is an opportunity for the Northwest.

The University of Chester will contribute to skills and supply chain capability with a number of ongoing projects including a National project, the Industrial Decarbonisation Research and Innovation Centre based at Heriot-Watt University, Edinburgh. The University of Chester is the academic lead for the Northwest on the project and co-investigator leading on the industrial decarbonisation workforce planning aspects, identifying the key skills and supply chain capacity requirements to maximise the benefits to UK PLC. The HyNet Northwest consortium is being hosted at the Thornton Science Park which is owned by the University of Chester.

Robert McDonald

Education Officers

A Case Study

As can be expected with the current pandemic we have not been able to become involved with schools and colleges other than by virtual events. Some time ago Roger outlined a talk and presentation on light. This was where the outside light came from, how we have made it over the centuries and how we can now produce some very efficient lighting using LEDs.

This was first given a few years ago at a primary school near Chester Zoo. The question 'If the Sun went out now how long would it be before it went dark?' There were lots of suggestions but it was stated that it would be eight minutes and twenty seconds and if we knew how fast light travelled, which was 300 000 metres per sec, we could work out how far we were from the Sun.

'Sir, Sir' came a call from a ten year old boy.

'Yes' I said.

'I think the Sun is one hundred and fifty million kilometres from Earth.' He replied.

Wow he was right so we had a budding mathematician in the class.

We pretended that their teacher was on Mars and I wanted to phone her. I went through the motions of making a call on my phone.

'That's funny her phone hasn't rung. Never mind lets continue talking about light.'

Fifteen minutes later she makes her phone ring.

'Its taken fifteen minutes for my phone signal that travel at the same speed as light to reach Mars. How are we going to talk to people on Mars?'

General discussion on emails, SMS messages and then 'Sir, Sir.' Yes the same boy.

'I think Mars is three hundred million kilometres from Earth.'

Again he was correct.

This is the delight of running such talks and presentations at primary schools as when the children are given a few facts or bits of equipment you are never surprised at what they can come up with.

So my light presentation will have to wait until next year and I already have a number of schools who want me to give the presentation.

Meanwhile I have been completing a set of stories on a family of country rats that get involved in science and engineering experiments. The stories are aimed at children aged 7 and upwards and we do have some adult fans. IET Stevenage is looking to make the stories available on the website so they can be used by members across the IET spectrum. The stories are presented in a way that technical items can be explained without getting too technical. The story is called 'Meet the Smeeks' and two of the characters are shown below.

We have received invitations in the New Year to attend Careers Events from Sir John Deanes Sixth Form College Northwich, Wargrave House School in Newton – le Willows, Cheshire College South and West Ellesmere Port and finally The Bridge School in Runcorn being a Pupil Referral Unit as the students who attend this school require additional Career inspiration.

The attendance at all of the above depends on the IET future COVID policy on face to face meetings.

Roger Todd

Grid Stability: Maintaining Grid Stability with Changes in Electricity Generation and Usage

On 19th October 2021, IET Member, Darren Jones, Technology Manager, Hitachi Energy, gave a Zoom webinar on the topic of "Grid Stability: Maintaining grid stability with changes in electricity generation and usage". Darren introduced himself explaining that he had been with Hitachi Energy for over three years and had been Innovation Manager with Electricity North West, the Distribution Network Operator (DNO) for the North West of England and working at consultants, AEA Technology prior to this.

The presentation started with a review of the evolution of the Electricity Grid System in the UK. The grid system has been evolving for over one hundred years. The system is now being impacted by the transition from fossil fuel electricity generation to renewable electricity generation. This transition is being accelerated with the UK Government's Statutory Obligation to achieve Net Zero by 2050. Renewable electricity generation is more dynamic and unpredictable in nature and therefore increases the cost of ensuring system stability. Grid resilience and robustness can be maintained with the use of modern technology including advanced automation, protection systems and hardware components.

A list of some of the key UK Legislation over the last one hundred years for the UK Electricity System was shown, the first legislation being the Electricity Lighting Act of 1882. The first electrical networks were small independent "island" networks, driven by the move to stop using gas for domestic lighting. In the 1920s and 1930s, the independent electrical networks started to become interconnected. The use of 240 V a.c. and 11 kV a.c. voltage levels came about as a compromise to allow the interconnection of the different networks.

In order to operate a stable and secure electricity grid system, the grid has to have four services, inertia, system strength, frequency, and voltage control. If supply into the grid is less than the demand, then either the generation input has to be increased or the demand decreased. Conversely, if the supply is greater than the demand, the generation input has to be decreased or the load increased. There is an obligation on National Grid ESO, the Electrical System Operator for the UK to balance the grid, maintaining the system frequency between the statutory limits of 49.5 Hz and 50.5 Hz, but the operational limits are tighter than this. National Grid ESO has a range of balancing and ancillary market mechanisms to keep the system in balance.

In the UK, total energy generation is down by 18% since 2010, with this trend driven by improvements in energy efficiency. Since 2010, fossil fuel energy generation is down 59% and renewable energy generation is up fivefold. By 2050 solar and wind generation could more than quadruple. Renewable energy generation is uncertain, and variable compared with fossil fuel energy generation. Wind turbines to not operate at a fixed frequency compared with traditional thermal (steam) turbines. Renewable energy generators do not provide the inertia or short circuit current compared with large, legacy steam turbine generators.

Inertia is the resistance of a physical system to change in its position or state of motion. In a power system, inertia is given to the store of kinetic energy in the rotating mass of large generator turbines sets giving a steady system frequency. In turn, inertia drives the maximum short circuit current under fault conditions. The short circuit current is detected by the network protection systems which in turn disconnects the faulty part of the grid from the healthy part, thus avoiding cascade failures. As the large generator turbine sets are replaced by generators with less rotating mass, inertia is being lost from the grid. The UK grid system has enough inertia to sustain the network frequency for 10 seconds, with fast frequency response systems such as battery storage systems being used to sustain the system frequency. The lowest frequency the system experiences under fault is called the frequency nadir. The less inertia that is in the grid system, the harder it is to sustain frequency and therefore other means of maintaining system inertia is needed.

There are technological solutions to replace the large rotating mass generators as more low inertia generators

replace them. These technologies include synchronous condensers, large rotating mass flywheels driven by motor / generators, battery storage systems, static compensators and data driven forecasting and system modelling. Demand side response is already used by National Grid to manage stability and demand peaks. This is only possible with large industrial and commercial customers or aggregated small to medium enterprises. From 2018, Distributed Network Operators (DNO) have been committed to always seeking flexibility from connected customers before building new infrastructure.

To achieve Net Zero, significant investment is needed in data and digitalisation; network owners need to 'see' how assets are performing and where power is flowing. The approaches currently being used for "high value" Transmission Networks will need to be applied at the Distribution and Low Voltage Network levels. Decision makers need high-quality, real-time data, to manage the grid system effectively. With more data and digitisation, better decisions on network management can be made.

As we move from the situation today with 300 MW of battery storage, five million smart electricity meters, the system balanced using large generators and 300 000 electric vehicles to several GW of battery storage, eleven million electric vehicles, 30 million smart meters and the system balanced by a range of energy sources and storage by 2030, there will be a need to have more automatic control of the grid system. This may include the use of Artificial Intelligence (AI) systems. There will be innovative technologies, methods of understanding, and business models needed to allow the electrical grid to operate as we move towards Net Zero.

The webinar is available for viewing on the IET Mersey and Western Cheshire YouTube channel.

Robert McDonald

Biomedical Engineering Group – Manufacturing and Management Group

Additive Manufacturing for the Medical Industry: How Can Digital Manufacturing Accelerate Medical Device Development?

On 13th October 2021 the Biomedical Engineering Group jointly with the Manufacturing and Management Group organised a webinar on Digital Manufacturing, Device Development for the Medical Industry.

Protolabs' Application Engineer and Additive Manufacturing Champion, Tasos Pantelis, discussed the benefits digital manufacturing can bring to the medical industry.

Interactive design analysis, low-volume production, bridge tooling before production, and rapid prototyping are just a few reasons why the world's leading medical device development companies turn to Protolabs to unlock the possibilities available with the digital manufacturing model. Coupled with specialist insider knowledge, this webinar explored these benefits, as well as how to choose the correct service for your application, and how and why 3D printing is used for medical device development.

In this session, Protolabs shared expert knowledge to provide you with the insight and know-how to adopt digital manufacturing within the medical sector, and Protolabs aren't short of inspiration. Throughout the webinar, Tasos shared real-life examples of how digital manufacturing and the medical industry can work together, everything from the Parker Hannifin Robotic Exoskeleton to the Novax DMA 3D printed cranial implant.

Tasos presented some of the world's fastest digital manufacturing sources for custom prototypes and low-volume production parts, using advanced injection moulding, CNC machining and 3D printing technologies to produce parts within days. It all results in an unprecedented speed-to-market value for product designers and engineers worldwide.

The Indego is a robotic exoskeleton designed to help patients with lower limb paralysis walk again. During development, Parker Hannifin used Protolabs to quickly test design improvements.

Did you miss this webinar? The content is now available on-demand: https://www.youtube.com/channel/UC-pPv6nQ_Z7PzMi0eVNQKtQ.

Protolabs are also offering a free comprehensive eBook further exploring digital manufacturing and the medical industry, redeem your free eBook today at: https://bit.ly/mfg-medical-ebook.

Want to find out more? Visit protolabs.co.uk.

Jade Jones

Faculty of Science and Engineering

University of Chester

Faculty of Science and Engineering

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How Wearable Technology Could Improve the Lives of Prosthetic and Orthotic Users

On 15th September 2021 Benjamin Griffiths from the University of Salford gave a talk on how wearable technology could be used to improve the life of prosthetic and orthotic (P&O) users. Benjamin's research aims to understand, in a world of ever increasing advancements in prosthetic technology, how do developments and intended uses in the lab translate to user's needs?

The research situation

We currently have the ability to create great and interesting P&O devices. We're also starting to develop better frugally designed devices to meet the vastly increasing demand in middle and low income countries.

The problem is…

We currently don't have a clear understanding of how people are using their current devices in their everyday lives. The design and development of these products is based on the idea that people are going to use them in their intended manner so that they fit into normal life and improve their functional ability. However, most of the development is based on lab experiments to understand how these devices could be used, and actually, very little is done to monitor their usage after they have left the clinic.

So why is this important?

By better understanding how a person is using a device we can take a user-centred design, approach where the devices can be adjusted to suit the users' needs and hopefully improve their functional outcomes. More importantly, by understanding how amputees are using their device, we can better allocate resources, improve existing services and better forecast future needs.

What did we do?

To address this, we have developed a method for monitoring lower limb amputees' physical behaviours using a prosthesis integrated accelerometer. Current approaches for monitoring human physical behaviours use a single thigh-worn device. However, in a lower-limb amputee population, we can embed the device within the prosthesis, eliminating issues with compliance and enabling increased battery size to extend monitoring time. We developed a methodology for recognising physical behaviour postures (lying, sitting, standing, and walking) from a single shank-located accelerometer.

The outcome

We were able to build a random forest classification model that was able to accurately classify the four postures with greater than 90% classification accuracy, which we deemed suitable for use to assess these physical behaviours.

What next?

Now that this method has been developed, we're about start collecting data in Cambodia where participants are trialling the new prosthetic knee design. We're hoping to collect data that will enable us to validate our classification algorithm on this specific population and also use it to understand how the prosthesis user's physical behaviour changed with the introduction of their new device.

Take home message

So, the take home message of this presentation is… We have the ability to create useful and effective P&O products, but we don't have a satisfactory level of knowledge of how people are using these devices. There is research being done to develop systems to monitor P&O usage in normal everyday situations. Research is also starting to emerge on what users can achieve with these devices and ultimately how they use them and how they impact their lives. However, for this to become common clinical practice we need to realise the relevant outcome measures we can use to measure usage and develop systems to feed this information back to clinicians so they can ultimately make better, more informed decisions.

The Prosthetic and Orthotic space has lots of scope for research in many diverse locations, but a key starting point to developing new technologies is to understand what user's needs are and how they use current devices.

This excellent webinar was well attended and it had a lively Q/A session.

Jack Hayes

The Institution of Engineering and Technology

IET Sectors

Built Environment | Design and Manufacturing | Digital | Education and Skills | Energy

DATE	EVENT AND LOCATION	PRESENTER
Wednesday, 26th January	**From Idea to Scaleup: Tackling Fundraising, Team Building & Financial Modelling to Successfully Commercialise Engineering Innovations** Webinar	Kayode Odeleye, Founder and CEO, CANEA Charlotte Vermedal, Product Marketing Manager, CANEA
Wednesday, 2nd March	**Technical Visit to Bilfinger UK – Digital Solutions** Bilfinger UK, Prospect House, Kilbuck Lane, St. Helens WA11 9UX **Tentative Venue, it could be Webinar**	Mark Kelly, Head of Digital & Innovation, Steve Lang, Director of Automation & Digital Solutions
Wednesday, 9th March	**Present Your Brilliance 2022** **Formerly Present Around the World** Sensor City, 31 Russell Street, Liverpool L3 5LJ	Competitors
Wednesday, 16th March	**Latest Advancements in Biomedical Engineering Research, from Ophthalmic Devices to Biomaterials and Artificial Intelligence** Webinar	Professor Rachel Williams, Professor Ahmed Elsheikh, Dr. Raechelle D'Sa, Dr. Yalin Zheng
Tuesday, 22nd March	**Aspects of the European Spallation Source** YMCA Wirral, 56 Whetstone Lane, Birkenhead CH41 2JT	Dr Norman Turner PhD BSc, Researcher, University of Huddersfield
TBC March	**LifeSkills** TBC	IET LifeSkills Trainer
Wednesday, 6th April	**Technical Visit to Ford Halewood Transmissions Limited – CHP Plant Project** Halewood Transmission Plant, Speke Boulevard, Halewood, Liverpool L24 9LE **Tentative Venue, it could be Webinar**	Phil Boden, Production Manager, Simon Smith, CHP Project Lead
Wednesday, 20th April	**Biomaterials and Medical Devices for Cardiovascular Applications** Webinar	TBC
Tuesday, 26th April	**Advances in Electronically Active Textiles** YMCA Wirral, 56 Whetstone Lane, Birkenhead CH41 2JT	Professor Tilak Dias, Nottingham Trent University
Wednesday, 11th May	**Technical Visit to Swinton Electro Plating Ltd – Green Surface Engineering Joint Event with the Surface Engineering Association / Swinton Electro Plating** Royal Oak Works, Oak St, Swinton, Pendlebury, Manchester M27 4FL **Tentative Venue, it could be Webinar**	Godfrey Evans, Managing Director and Chairman, Dave Elliott, Surface Engineering Association

All our events are free to attend for

For more information on how the IET supports CPD

Recorded webinars can be viewed on

https://www.youtube.com/channel/

If you do not have access to the internet, registration can

Contact details are shown on

Events: January 2022 – September 2022

Mersey and Western Cheshire Network

| Engineering Safety | Healthcare | Transport | Innovation and Emerging Technologies

SECTOR	GROUP	Time	CONTACT	CPD
Healthcare	Biomedical Engineering	Start 5:30 p.m. Finish 7:00 p.m.	Shruti Turner, Jack Hayes Online registration	2
Design and Manufacturing	Manufacturing and Management	Start 6:30 p.m. Refreshments and Networking 6:00 p.m. Finish 8:00 p.m.	Mark Kelly, Andrew Kaldos Online registration	2
All	Young Professionals	Start 5:00 p.m. Finish 8:00 p.m.	Darshan Gahle, Michelle O'Brien Online registration	2
Healthcare	Biomedical Engineering	Start 5:30 p.m. Finish 7:00 p.m.	Ashkan Eliasy, Shruti Turner, Jack Hayes Online registration	2
Innovation and Emerging Technologies	Electronics and e-Systems	Start 6:30 p.m. Refreshments and Networking 6:00 p.m. Finish 8:30 p.m.	Brian Clark, Essential and requested by email or telephone	2
Education and Skills	Young Professionals	Start TBC Finish TBC	Alex Headspith Online registration	3
Design and Manufacturing	Manufacturing and Management	Start 6:00 p.m. Refreshments and Networking 5:30 p.m. Finish 7:30 p.m.	Phil Boden, Andrew Kaldos Online registration	1
Healthcare / Design	Biomedical Engineering	Start 6:00 p.m. Finish 7:30 p.m.	Jack Hayes, Shruti Turner Online registration	1
Innovation and Emerging Technologies	Electronics and e-Systems	Start 6:30 p.m. Refreshments and Networking 6:00 p.m. Finish 8:30 p.m.	Brian Clark Essential and requested by email or telephone	2
Design and Manufacturing	Manufacturing and Management	Start 3:00 p.m. Refreshments and Networking 5:30 p.m. Finish 6:00 p.m.	Godfrey Evans, Michael Gilbert Online registration	3

IET members and non-members alike

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be done via e-mail or telephone to the contact listed

event synopses on pages 14–29

DATE	EVENT AND LOCATION	PRESENTER
Wednesday, 18th May	**Technical Visit – Jodrell Bank** Jodrell Bank, Macclesfield SK11 9DL	Jodrell Bank Staff
Wednesday, 25th May	**Advanced Healthcare Applications in Optical 3D Metrology** Liverpool John Moores University, James Parsons Building **Tentative Venue, it could be Webinar**	Stuart Dix, GOM Technical Manager
TBC	**Digital Transformation of the NHS** YMCA Wirral, 56 Whetstone Lane, Birkenhead CH41 2JT	Gary Walters, Business Development Director, Parity Medical
Wednesday, 15th June	**Graduate Apprentice Seminar –** **Digital Technologies Enabling Business Re-imagination** VEC-Daresbury, Keckwick Lane, Warrington WA4 4FX **Tentative Venue, it could be Webinar**	David Bogg, Campus Technology Hub Manager, STFC, Andrew Borman, Commercialisation Manager, VEC, Andrew Conley, Additive Manufacturing Engineer, STFC
Tuesday, 21st June	**IET MWC Leadership Seminar 2022** Webinar	Jerry Hopkins, Managing Director, Hopkins and Ball, TBC leading industrial experts
Thursday, 23rd June	**Women in Engineering Event – 2022** The Engine Rooms, Birchwood Park, 101 Faraday St, Risley, Warrington WA3 6YN	TBC
Wednesday, 29th June	**Biomedical Advances due to the COVID-19 Pandemic** Webinar	TBC
Wednesday, 21st September	**3D Printing and Wearables in Healthcare** Sensor City, 31 Russell Street, Liverpool L3 5LJ **Tentative Venue, it could be Webinar**	TBC
Tuesday, 27th September	**The Red Box – the History, Evolution and Future of the Phone Box** YMCA Wirral, 56 Whetstone Lane, Birkenhead CH41 2JT	Nigel Linge, Professor of Telecommunications, University of Salford

Event Programme January 2022 – September 2022

January

From Idea to Scaleup: Tackling Fundraising, Team Building & Financial Modelling to Successfully Commercialise Engineering Innovations

Date: *Wednesday, 2nd March*

Time: *Start 5:30 p.m.*
Finish 7:00 p.m.

Venue: Webinar

Speakers: *Kayode Odeleye, Founder and CEO, CANEA, Charlotte Vermedal, Product Marketing Manager, CANEA*

Engineers always come up with smart ideas, but lack the knowledge on how to build a business around their idea. In this session Kayode, Co-Founder and CEO of Caena, and Charlotte, the Product Marketing Manager, will teach you:

1. Balancing engineering innovation with commercialisation to develop and distribute winning products.
2. How to effectively communicate vision and financial outcomes to investors (Storytelling with Data).
3. General fundraising discussion – from pre-seed to IPO and beyond.

Online registration / CPD 2 hrs

Contact: *Shruti Turner, shruti.turner@ietvolunteer.org,*
Jack Hayes, jack.hayes@ietvolunteer.org

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SECTOR	GROUP	Time	CONTACT	CPD
Innovation and Emerging Technologies	Young Professionals	Minibus departs University of Liverpool, Brownlow Hill: 10:30 a.m Start 12:00 noon Finish 4:00 p.m.	Adam Wilson, Bibek Darjee, Georgia Edwardson Online registration	3
Healthcare / Design and Manufacturing	Biomedical Engineering Jointly with Manufacturing and Management Group	Start 6:00 p.m. Refreshments and Networking 5:30 p.m. Finish 8:00 p.m.	Stuart Dix, Andrew Kaldos Online registration	2
Digital / Healthcare	Electronics and e-Systems	Start 6:30 p.m. Refreshments and Networking 6:00 p.m. Finish 8:30 p.m.	Brian Clark Essential and requested by email or telephone	2
Design and Manufacturing	Manufacturing and Management	Start 6:30 p.m. Refreshments and Networking 6:00 p.m. Finish 8:30 p.m.	David Bogg, Andrew Borman, Andrew Kaldos, Michael Gilbert Online registration	2
Design and Manufacturing / Management	Manufacturing and Management	Start 2:00 p.m. Finish 3:30 p.m.	Jerry Hopkins, Michael Gilbert, Andrew Kaldos Online registration	1
All	Young Professionals	Start .3:00 p.m. Refreshments and Networking 5:15 p.m. Finish 6:00 p.m.	Bibek Darjee, Georgia Edwardson Online registration	3
Healthcare	Biomedical Engineering	Start 6:00 p.m. Finish 8:00 p.m.	Shruti Turner, Jack Hayes Online registration	2
Design and Manufacturing / Healthcare	Manufacturing and Management / Jointly with Biomedical Engineering Group	Start 5:30 p.m. Refreshments and Networking 5:00 p.m. Finish 7:30 p.m.	Ashkan Eliasy, Michael Gilbert, Andrew Kaldos Online registration	2
Innovation and Emerging Technologies	Electronics and e-Systems	Start 6:30 p.m. Refreshments and Networking 6:00 p.m. Finish 8:30 p.m.	Brian Clark Essential and requested by email or telephone	2

Event Programme January 2022 – September 2022

March

Technical Visit to Bilfinger UK – Digital Solutions
Date: *Wednesday, 2nd March*
Time: *Start 6:00 p.m.*
Refreshments and Networking 6:00 p.m.
Finish 8:00 p.m.
Venue: Bilfinger UK, Prospect House, Kilbuck Lane, St. Helens WA11 9UX
Tentative Venue, it could be Webinar
Speakers: *Mark Kelly, Head of Digital & Innovation,*
Steve Lang, Director of Automation & Digital Solutions

A journey into the world of Digitalisation and Automation demonstrating how Bilfinger UK are making the tools and systems mean something to our industries, our clients and ourselves including demos of some of the key technologies. We will explain our journey so far, how we narrow down the huge selection of digital tools and platforms adopting more of a ground up approach finding solutions that work in day to day operations and in people's hands in the field. Site tour and Q/A session.
Online registration / CPD 2 hrs
Contact: *Mark Kelly, mark.kelly@bilfinger.com,*
Andrew Kaldos, andrew.kaldos@ntlworld.com

Present around the World – 2022
Date: *Wednesday, 9th March*
Time: *Start 5:00 p.m.*
Finish 8:00 p.m.
Venue: Sensor City, 31 Russell Street, Liverpool L3 5LJ
Speakers: *Competitors*

Present around the World (PATW) is the IET's presentation competition for young engineers and technicians, aged 18 to 30. Applicants may come from all walks of engineering life: students,

recent graduates, apprentices, and young professionals. The competition is open to both IET members and non-members. Individuals give presentations for 10 minutes on a subject related to engineering and technology and answer questions for five minutes. The emphasis is on the presenter's presentation skills, enabling competitors at varying levels of their studies or career to participate on an equal footing. The event is now Present Your Brilliance and only consists of a local heat.
Online registration / CPD 2 hrs
Contact: *Darshan Gahle,*
Michelle O'Brien

Latest Advancements in Biomedical Engineering Research, from Ophthalmic Devices to Biomaterials and Artificial Intelligence
Date: *Wednesday, 16th March*
Time: *Start 5:00 p.m.*
Finish 8:00 p.m.
Venue: Webinar
Speakers: *Professor Rachel Williams,*
Professor Ahmed Elsheikh,
Dr. Raechelle D'Sa,
Dr. Yalin Zheng
This event will present four projects at the forefront of biomedical engineering research. It will explore interesting topic on where we are after half a century development in ophthalmology, use of artificial intelligence in biomedical engineering and surface modification of biomaterials for antimicrobial and tissue engineering applications. In this session you will learn from experts in these fields who are extending the boundary of knowledge in this field. Non- IET members are also welcome to join for this 90 minutes of thrilling expert presentations.
Online registration / CPD 2 hrs
Contact: *Ashkan Eliasy, ashkan@eliasy.com,*
Shruti Turner, shruti.turner@ietvolunteer.org,
Jack Hayes, jack.hayes@ietvolunteer.org

Aspects of the European Spallation Source
Date: *Tuesday, 22nd March*
Time: *Start 6:30 p.m.*
Refreshments and Networking 6:00 p.m.
Finish 8:30 p.m.
Venue: YMCA Wirral, 56 Whetstone Lane, Birkenhead CH41 2JT
Speakers: Dr Norman Turner PhD BSc, Researcher, University of Huddersfield
The European Spallation Source is being built at Lund in Sweden at an estimated cost in excess of 1.6 billion Euros. It will use a linear accelerator to accelerate protons into a tungsten target to create the most powerful spallation neutron source in the world. The UK is making several "in kind" contributions. The talk will describe some high-level design decisions in the design of the accelerator and then focus on two detailed design issues in relation to the RF system.
Essential and requested by email or telephone / CPD 2 hrs
Contact: *Brian Clark, bjclarkobe@btinternet.com*

LifeSkills
Date: *TBC March*
Time: *Start TBC*
Finish TBC
Venue: TBC
Speakers: *IET LifeSkills Trainer*
LifeSkills for engineers, technicians and students – provided by the IET.
Online registration / CPD 3 hrs
Contact: *Alex Headspith, Alex.Headspith@ietvolunteer.org*

April

Technical Visit to Ford Halewood Transmissions Limited – CHP Plant Project
Date: *Wednesday, 6th April*
Time: *Start 6:00 p.m.*
Refreshments and Networking 5:30 p.m.
Finish 7:30 p.m.
Venue: Ford Halewood Transmission Plant, Speke Boulevard, Halewood, Liverpool L24 9LE
Tentative Venue, it could be Webinar
Speakers: *Phil Boden, Production Manager*
Simon Smith, CHP Project Lead
During 2021 Halewood have installed a new Combined Heat and Power (CHP) plant. The project has provided all the electricity needs for the plant, the waste heat has been used within the plant to lower kWh for process heating.
The site visit will start with a presentation by the Project Lead to explain the project.
Topics to be discussed: Overview the project, A review of the project plan, Explanation of the equipment used, Planning and integration into Scottish Power network, Why Halewood needed Good Quality CHP – tax incentives, What the project has delivered? Good points and lessons learnt. Site visit followed by a Q/A session.
Online registration / CPD 1 hr
Contact: *Phil Boden, pboden@ford.com,*
Andrew Kaldos, andrew.kaldos@ntlworld.com

Biomaterials and Medical Devices for Cardiovascular Applications
Date: *Wednesday, 20th April*
Time: *Start 6:00 p.m.*
Finish 7:30 p.m.
Venue: Webinar
Speakers: *TBC*
The prevalence of cardiovascular conditions is increasing across the world. Developments in both tissue engineering and device creation are progressing to address these issues.
Online registration / CPD 1 hr
Contact: *Jack Hayes, Jack.hayes@ietvolunteer.org,*
Shruti Turner, Shruti.turner@ietvolunteer.org

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Advances in Electronically Active Textiles
Date: *Tuesday, 26th April*
Time: *Start 6:30 p.m.*
Refreshments and Networking 6:00 p.m.
Finish 8:30 p.m.
Venue: YMCA Wirral, 56 Whetstone Lane, Birkenhead CH41 2JT
Speakers: *Professor Tilak Dias, Nottingham Trent University*

Today, the demand for wearable electronic devices, e.g. to monitor blood pressure, body temperature, is growing. Textiles have a major role to play in this strategically important area and offer many advantages over traditional materials such as support for technologically advanced products, flexibility, softness and high strength-to-weight ratios. This presentation investigates how modern textile technologies can be used to create such wearable textiles and explains ways by which this is being achieved and yet maintains the required fashion sense expected of clothing in these modern times.

Essential and requested by email or telephone / CPD 2 hrs
Contact: *Brian Clark, bjclarkobe@btinternet.com*

May

Technical Visit to Swinton Electro Plating Ltd – Green Surface Engineering
Joint Event with the Surface Engineering Association / Swinton Electro Plating
Date: *Wednesday, 11th May*
Time: *Start 3:00 p.m.*
Refreshments and Networking 5:30 p.m.
Finish 6:00 p.m.
Venue: Royal Oak Works, Oak St, Swinton, Pendlebury, Manchester M27 4FL
Tentative Venue, it could be Webinar
Speakers: *Godfrey Evans, Managing Director and Deputy Chairman,*
Dave Elliott, Surface Engineering Association

A technical lecture detailing the importance of surface engineering to the manufacturing supply as virtually every manufactured product requires some form of surface engineering to enable it to function as expected. There will be examples of the application of surface engineering and a worked example of its benefit to the environment. The SEA is the voice of the industry, working at every level to ensure that its members are informed and fairly represented in Parliament in the UK and at a European level. The presentation will be followed by a site tour and a Q/A session.

Online registration / CPD 3 hrs
Contact: *Godfrey Evans, Godfrey@swintonplating.com,*
Michael Gilbert, Michael.gilbert@ietvolunteer.org

Technical Visit – Jodrell Bank
Date: *Wednesday, 18th May*
Time: *Minibus departs University of Liverpool, Brownlow Hill: 10:30 a.m*
Start 12:00 noon
Finish 4:00 p.m.
Venue: Jodrell Bank, Macclesfield SK11 9DL
Speakers: *Jodrell Bank Staff*

This Young Professionals event is a technical visit to Jodrell Bank, Macclesfield. Jodrell Bank's bold and pioneering story is widely regarded to be of national and international significance.

For over 70 years, Jodrell Bank Observatory has been a world-leading science research institute, continuously pushing back the boundaries of our knowledge and understanding of the universe. While the scientists at Jodrell Bank continue to work at the cutting edge of modern astrophysics, there is a new awareness of the importance of those early developments that took place here.

Online registration / CPD 3 hrs
Contact: *Adam Wilson, Adam.Wilson@ietvolunteer.org,*
Bibek Darjee, Bibek.Darjee@ietvolunteer.org,
Georgia Edwardson,
Georgia-Ann.Edwardson@ietvolunteer.org

Advanced Healthcare Applications in Optical 3D Metrology
Date: *Wednesday, 25th May*
Time: *Start 6:00 p.m.*
Refreshments and Networking 5:30 p.m.
Finish 8:00 p.m.
Venue: Liverpool John Moores University, James Parsons Building
Tentative Venue, it could be Webinar
Speakers: *Stuart Dix,*
GOM Technical Manager

The presentations will cover the newly developed non-contact measuring solutions to tackle any application and budget, ranging from entry level manual and handheld systems through to fully automated systems. GOM offers machines and systems for manual and automated 3D digitising, evaluation software, training and professional support in industries such as automotive, aerospace, energy and consumer goods. Parts ranging from several millimetres in size through to complete aircraft can be inspected with high accuracy and relative ease. Industrial case studies and Q/A session will close the event.

Online registration / CPD 2 hrs
Contact: *Stuart Dix, S.Dix@gom.com,*
Andrew Kaldos, andrew.kaldos@ntlworld.com

Recorded webinars can be viewed on
IET Mersey & Western Cheshire – YouTube
https://www.youtube.com/channel/UC-pPv6nQ_Z7PzMi0eVNQKtQ

June

Digital Transformation of the NHS
Date: *TBC*
Time: *Start 6:30 p.m.*
Refreshments and Networking 6:00 p.m.
Finish 8:30 p.m.
Venue: YMCA Wirral, 56 Whetstone Lane, Birkenhead CH41 2JT
Speakers: *Gary Walters,*
Business Development Director, Parity Medical

The use of Digital Technology has the potential to transform the way patients engage with services, improve the efficiency and co-ordination of care, and support people to manage their health and wellbeing at an estimated cost of £ 13 bn over the next 5 years. The presentation will provide an overview of that plan and identify the key technologies that will help deliver it. The specific applications covered will be electronic patient records, electronic Prescribing of Medicines, Picture Archiving and Communications System (PACS) and Telemedicine.
Essential and requested by email or telephone / CPD 2 hrs
Contact: *Brian Clark, bjclarkobe@btinternet.com*

Graduate Apprentice Seminar –
Digital Technologies Enabling Business Re-imagination
Date: *Wednesday, 15th June*
Time: *Start 6:30 p.m.*
Refreshments and Networking 6:00 p.m.
Finish 8:30 p.m.
Venue: VEC-Daresbury, Keckwick Lane, Warrington WA4 4FX
Tentative Venue, it could be Webinar
Speakers: *David Bogg,*
Campus Technology Hub Manager, STFC,
Andrew Borman,
Commercialisation Manager, VEC,
Andrew Conley,
Additive Manufacturing Engineer, STFC

The VEC and STFC will provide an overview of how implementation of digital technologies helps to improve an organisation's ability to predict problems, make more effective decisions and more rapidly adapt operational responses. The Graduate Apprentice presentations will be followed by a tour and a Q/A session
Online registration / CPD 2 hrs
Contact: *David Bogg, david.bogg@stfc.ac.uk,*
Andrew Borman, A.Borland@liverpool.ac.uk,
Andrew Kaldos, andrew.kaldos@ntlworld.com,
Michael Gilbert, Michael.Gilbert@ietvolunteer.org

IET MWC Leadership Seminar 2022
Date: *Tuesday, 21st June*
Time: *Start 2:00 p.m.*
Finish 3:30 p.m.
Venue: Webinar
Speakers: *Jerry Hopkins, Managing Director, Hopkins and Ball,*
TBC leading industrial experts

An essential event for those engineers seeking to lead organisation now and in the future. A chance to hear experienced industry leaders talk on what leadership means to them and to ask questions to the panel. Three experienced North West based business leaders will be sharing their thoughts on what it takes to be a great leader and keeping teams engaged in the new 'normal'. This really is a unique chance to assess whether leadership is for you and pick up some great tips on how to be effective in leading teams and businesses.
Online registration / CPD 1 hr
Contact: *Jerry Hopkins, jerry@hopkinsandball.com,*
Michael Gilbert, Michael.Gilbert@ietvolunteer.org,
Andrew Kaldos, andrew.kaldos@ntlworld.com

Women in Engineering Event – 2022
Date: *Thursday, 23rd June*
Time: *Start .3:00 p.m.*
Refreshments and Networking 5:15 p.m.
Finish 6:00 p.m.
Venue: The Engine Rooms, Birchwood Park, 101 Faraday St, Risley, Warrington WA3 6YN
Speakers: *TBC*

This event will aim to be a competition where women in engineering will be able to present their work or research. Prizes will be available but they have not been confirmed yet.
Online registration / CPD 3 hrs
Contact: *Bibek Darjee, Bibek.Darjee@ietvolunteer.org,*
Georgia Edwardson,
Georgia-Ann.Edwardson@ietvolunteer.org

Biomedical Advances due to the COVID-19 Pandemic
Date: *Wednesday, 29th June*
Time: *Start 6:00 p.m.*
Finish 8:00 p.m.
Venue: Webinar
Speakers: *TBC*

The global pandemic of COVID-19 has put a strain on many healthcare settings across the world. With the pressure has come great innovation, seeing multidisciplinary teams work together to create solutions for immediate problems.
Online registration / CPD 2 hrs
Contact: *Shruti Turner, Shruti.turner@ietvolunteer.org,*
Jack Hayes, Jack.hayes@ietvolunteer.org

Recorded webinars can be viewed on
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https://www.youtube.com/channel/UC-pPv6nQ_Z7PzMi0eVNQKtQ

September

3D Printing and Wearables in Healthcare
Date: *Wednesday, 21st September*
Time: *Start 5:30 p.m.*
Refreshments and Networking 5:00 p.m.
Finish 7:30 p.m.
Venue: 3D Printing and Wearables in Healthcare
Sensor City, 31 Russell Street, Liverpool L3 5LJ
Tentative Venue, it could be Webinar
Speakers: *TBC*

This event will cover two different topics. The first one on wearables, introduces the latest advancements in the industry and how wearables can improve health and wellbeing of people. Another topic is on 3D printing and will cover topics such as how 3D printing can be used to train doctors and also produce surgical guides and implants.

Online registration / CPD 2 hrs
Contact: *Ashkan Eliasy, ashkan@eliasy.com,*
Michael Gilbert, michael.gilbert@ietvolunteer.org,
Andrew Kaldos, andrew.kaldos@ntlworld.com

The Red Box – the History, Evolution and Future of the Phone Box
Date: *Tuesday, 27th September*
Time: *Start 6:30 p.m.*
Refreshments and Networking 6:00 p.m.
Finish 8:30 p.m.
Venue: YMCA Wirral, 56 Whetstone Lane,
Birkenhead CH41 2JT
Speakers: *Nigel Linge,*
Professor of Telecommunications, University of Salford

They have achieved iconic status; but are now seldom used! Nevertheless, they remain as an essential part of what makes Britain! This talk looks at the history and evolution of the humble British Phone Box through all its major models, including those that were introduced by organisations other than BT and also the one that is now more famous because it is used by a Time Lord. It will conclude by showing the latest designs that are appearing on our streets, looking at how many are being given a new lease of life as something quite different and show that, they are not all painted red!

Essential and requested by email or telephone / CPD 2 hrs
Contact: *Brian Clark, bjclarkobe@btinternet.com*

Mersey and Western Cheshire Network

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The Virtual Engineering Centre: Delivering Net Zero through Digital Transformation

The Virtual Engineering Centre (VEC) has over a decade's worth of experience in planning and delivering digital transformation strategies for companies, large and small.

From our early work in aerospace supply chains in the North West and its supply chain, to our most recent work driving the digital advancements of the manufacturing industry, realising energy efficiencies and carbon reduction, has always been at the core of what we do.

Our approach to digital engineering from simulation to virtual prototyping and advanced AI, all contribute to designing prototyping and delivering lighter, more energy-efficient and sustainable products.

The VEC has introduced several programmes of support for SMEs across the North West in digitalising their businesses, developing digital strategies for becoming better connected to their digital supply chains.

LCR4.0

Innovative European Regional Development Fund initiatives, LCR4 START and LCR4.0 Holistic aim to support Liverpool City Region SME business leaders to gain a competitive edge through the development of digital strategies for effective digital adoption whilst creating a first-of-a-kind city region supply chain network, offering greater business resilience, growth opportunities and diversification.

The LCR4.0 teams can help define your digital strategies through diagnostics and a digital fitness assignment informed by your business priorities and opportunities. Our teams can help plan your digital roadmap by structuring and focussing on what 'digital' can do for your business – planning your path to successful digital change.

Your business can build greater resilience and adaptability by digitalising suppliers and identifying opportunities for diversification and innovation across dynamic supply chains. Improving visibility with analytical insight can also enhance decision making, productivity, efficiencies, confidence and drive practical and cost-effective solutions.

Pairing our technical and engineering capabilities our team of industry and digital experts can offer bespoke support to prepare your teams for any digital change, ensuring your organisation has the right technology that is tailored to your operations model.

LCR4.0 projects can help facilitate innovation in your products and services from strategy to practical solutions, focussed proof of concept and implementation to help to create a unique proposition for inward investment and export post-COVID & Brexit.

CW4.0

CW4.0 helps manufacturing SMEs in Cheshire & Warrington accelerate opportunities for growth and investment using digital technology to become more productive, efficient, and relevant to the needs of your customers.

Offering SMEs the opportunity to gain hands-on support and expertise, the CW4.0 team enable manufacturers to develop smarter processes and products, and stay ahead of the competition by adopting new technologies emerging from the fourth industrial revolution (Industry 4.0).

SMEs have the opportunity to gain unique access to world-class facilities for gaining a greater understanding of new and innovative digital tools and technologies from advanced modelling, simulation, AI and data analytics to digital twins, visualisation, robotics and autonomous systems.

CW4.0 covers the full manufacturing sector, from general engineering and fabrication to automotive, renewables, pharmaceutical and medical devices, enabling even more businesses to gain access to this unique offering.

Providing your business with free access to a comprehensive range of facilities, technologies and experts, our team can support you in the integration of digital technologies into your business for overcoming existing and new business challenges such as reducing waste generated through virtual product development and testing, streamlining products to market whilst supporting the regions ambitions of reaching net carbon zero.

All projects are part-funded by the European Regional Development Fund.

The delivery partners across all projects include the Virtual Engineering Centre, The University of Liverpool's' Management School, Liverpool John Moores University, Science and Technology Facilities Council, Northern Automotive Alliance and the Growth Platform.

For more information visit: www.virtualengineeringcentre.com or contact our team to start your digital journey today: vec@liverpool.ac.uk or 01925 864 854.

Emma Green

IET Manufacturing Technical Network

Report on IET Manufacturing Technical Network

As referenced in previous Newsletters, the IET Manufacturing TN is active in promoting and raising awareness of developments in manufacturing and technology.

The TN held three meetings in October 2021 under a theme of Sustainability as follows:

Additive Manufacturing for Sustainability

Ollie Hartfield with The Manufacturing Technology Centre (MTC) talked about Additive Manufacturing in the context of the Circular Economy, explained how it supports the Sustainability Agenda and indicated some of the challenges that still need to be addressed.

Guy Adams from Hewlett Packard spoke about technical and process aspects of 3D printing and gave an example of use in a Moulded Fibre Tooling Solution.

Youssef Gaber from Apex Technologies and Suzanne Costello from MCS presented a case study involving the use of Laser Powder Bed Fusion (LPBF) Technologies as a means of creating unique parts for specific applications.

Metrology In Sustainable Manufacturing

Andrew Longstaff from the University of Huddersfield reviewed the importance of metrology throughout manufacturing and product lifecycles in terms of its potential positive impact on sustainability and highlighted opportunities through some of the future needs that will require new instruments, techniques, and an integrated approach to measurement data.

Kevin Hawley, a Director with GOM presented a case study in the application of 3D scanning in the production of components utilising a Metal Additive Manufacturing Process.

Scott Kettell, also with GOM, presented examples of how Dimensional Measurement can drive sustainability with reference to Aerospace examples.

Design for Sustainable Manufacturing

Martin Charter, Director, The Centre for Sustainable Design, UCA Farnham, covered products and the circular economy with examples and a case study on repair cafes.

Andy Clifton, Global Sustainability Manager with Rolls-Royce discussed the challenges and impact of sustainability and gave an example of determining the significance of specific impacts and responding to them.

Stewart Lowth, Product Development and Innovation Manager with MetLase, presented a case study on how Sustainable Design has been successfully applied in Fixture Manufacturing.

All three events were well attended gave significant insight into some of the challenges and opportunities in respect of manufacturing and sustainability.

You can access the events “on demand” using the following link: https://lnkd.in/drAp3ki7.

For 2022 we plan to concentrate on The Future of Manufacturing, and are planning events covering the following topics:

- Manufacturing Award for early Career Engineers,
- Future Roles for Manufacturing Engineers,
- The Future of Manufacturing Automation,
- Digital Manufacturing.

We also hope to host two networking events over the course of the year.

The TN is always willing to hear ideas and suggestions on topics to cover. We have openings for volunteers to join the TN and help reshape and expand the Executive. These opportunities range from simply attending a committee meeting, to bring new ideas to the table, through to the organising, running, and promoting of one of the events. For more details, please contact the TN Chair, Dr Chris Proudfoot christopher.proudfoot@ietvolunteer.org.

Chris Proudfoot

Mersey and Western Cheshire Network

Foothold – Supporting Members through the Covid-19 Pandemic

Foothold is the benevolent fund of the IET. The benevolent fund was set up to support members of the Institution of Electrical Engineers (IEE) 130 years ago. IEE grew and merged with other organisations to become the Institution of Engineering and Technology.

With the Covid-19 pandemic, it is a worrying time for many of us, but you can still count on the support of Foothold. Whether you are struggling to cover everyday expenses, looking after someone who is ill, or need a chat about what is going on and what to do next, please give Foothold a call on +44 (0)20 7344 5498 or mobile +44 (0)7923 257 087. The helpline is open 09:00 – 17:00, Monday to Friday. Also, you can email Foothold using hello@myfoothold.org.

The Foothold team is ready to help with:

- financial support,
- mental and physical wellbeing support,
- career support,
- legal support,
- care and disability support and much more.

For more information on Foothold, please use the link https://www.myfoothold.org/.

Rob McDonald

Electronics and e-Systems Group

Electronics and e-Systems Plan for 2022

The Group is planning a series of events for 2022. Assuming no restrictions, these will be face to face events to give the best chance of networking opportunities. These are outlined below. More details will be available nearer the time.

In March we will have a presentation on the European Spallation Source, being built at Lund in Sweden at an estimated cost of more than 1.6 bn Euros. It will use a linear accelerator to accelerate protons into a tungsten target to create the most powerful spallation neutron source in the world. The U.K. is making several "in kind" contributions. One such contribution is the RF distribution system for the superconducting cavities. The talk will describe some high-level design decisions in the design of the accelerator and then focus on two detailed design issues in relation to the RF system.

Today, the demand for wearable electronic devices, for example to monitor blood pressure and body temperature, offer many advantages over traditional materials such as support for technologically advanced products, flexibility, softness and high strength-to-weight ratios. This presentation in April investigates how modern textile technologies can be used to create such wearable textiles and explains ways by which this is being achieved and yet maintains the required fashion sense expected of clothing in these modern times.

The use of digital technology has the potential to transform the way patients engage with services, improve the efficiency and co-ordination of care, and support people to manage their health and wellbeing at an estimated cost of £13 bn over the next five years. The presentation in June, will provide an overview of that plan for the NHS and identify the key technologies that will help deliver it. The specific applications covered will be electronic patient records, electronic Prescribing of Medicines, Picture Archiving and Communications System (PACS) and Telemedicine.

They have achieved iconic status; but are now seldom used! Nevertheless, they remain as an essential part of what makes Britain! The talk in September looks at the history and evolution of the humble British Phone Box through all its major models, including those that were introduced by organisations other than BT and the one that is now more famous because it is used by a Time Lord. It will conclude by showing the latest designs that are appearing on our streets, looking at how many are being given a new lease of life as something quite different and show that, they are not all painted red!

This talk in November on the demystifying of 5G will provide an update and review of the transformational plans, capabilities, and outcomes from deployments in the UK. 5G networks are already enabling a step change in the range and capability of innovative applications from IoT to robotics. That pace of change is due to accelerate as 5G moves from its initial enhanced mobile broadband phase to deliver ultra-reliable and low latency communications along with massive machine type connectivity.

We are looking forward in 2022 to returning to some form of normality and trust you feel the same!

Gordon Nicholas

Mersey and Western Cheshire Network

Report on the Network

The LN is proud to have an approximately 4600 strong membership living in a considerably large region.

In line with the IET mission, the Local Network (LN) facilitates the dissemination of knowledge and the advancement of science, engineering and technology through the provision of various activities including school visits, lectures, seminars, workshops, technical visits, biannual recognition events, group meetings, and our Annual Dinner. The LN is governed by the Network Committee (NC), which meets six times a year and has representatives from all the sub-committees and specialist groups. The LN publishes two events newsletters per year, one in January and one in September. Traditionally the NC meetings have been face-to-face meetings, but we make every effort to use IT to organise as many meetings as possible as virtual meetings. The NC endorses major proposals, propose strategic direction, provides a forum for the sub-committees to network, delegates authority to the sub-committees and manages the event programmes and financial budget.

The sub-committees or groups are as follows:

- School Liaison Officers (SLO).
- Young Professionals Group.
- Energy and Environment Group.
- Electronics and e-Systems Group.
- Manufacturing and Management Group.
- Biomedical Engineering Group.
- Isle of Man Group.

The LN works in close cooperation with the region's Universities, Research and Development Institutions, Schools, Colleges and Industrial Companies both small and large, whose contribution to the events programme is absolutely instrumental to maintaining the provision of high quality activities.

The LN is keen to have new members to contribute to the work of the Network Committee and all sub-committees. Are you interested? Please contact any of the Key Contacts on page 25.

Andrew Kaldos

What Does the Engineering College Do for Industry in Upskilling?

Within the college we are able to provide upskilling through two main areas, apprenticeships and commercial training.

Apprenticeships give you the chance to earn as you learn – to gain hands-on experience from day one and start a career in a growing, exciting and highly innovative industry. Our Advanced Apprenticeship programmes have a success rate of over 90%, far surpassing the national average and cementing the Engineering College's status as a frontrunner in Engineering apprenticeships in the United Kingdom. The Engineering College works hard to create the right environment to learn and flourish in. Our apprentices tell us that being here isn't like being in school – that they're treated as adults. Our tutors all have experience of working in industry, and will teach you to take ownership of your learning, and responsibility for your actions as an engineer working in the industry.

For apprentices in terms of upskilling, we are able to embed quite a lot of knowledge and skills that the apprentice wouldn't necessarily pick up within their company. Through the new apprenticeship standards this has helped us to shape some of our curriculum to not only match what is currently happening within industry today, but where industry is going, mainly Industry 4.0. This means that we are looking to upskill our learners into the new digital world, enhancing our learning to the new modern ways of engineering such as CNC, 3D Printing, Augmented Reality, Plasma cutting and so much more. The Engineering College is determined to constantly keep up with new modern ways of engineering.

Our commercial department provide courses which are used to upskill and provide CPD for tradespeople. This can range from a basic grinding safety course to coded welding. We have plenty of these courses on offer, and these are lead by our Master Welder, Kevin Cairns.

Over the last couple of years, our team at the Engineering College have developed a clear understanding of gaps in the workforce and opportunities for businesses to dynamically adapt to a new digital environment, whether they take a leap of faith or small steps.

We can help to prepare your business for the future of engineering and technology by providing you with: information on apprenticeship standards, support in finding the right standard to suit both the employee and the business, support with upskilling your workforce, support with recruitment of an apprentice, advice on funding and grants and access to regional networks.

Ellena Rolfe

Local Network Key Contacts

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Editor: Andrew Kaldos **Editorial Board: Godfrey Evans, Rob McDonald, Garfield Southall**			

Can't find the contact you need?

You will find contact details for each event in the event synopsis on pages 18–23.

Search "IET Mersey & Western Cheshire"
on these social media sites to keep up to date with events and activities!

BILFINGER UK

BILFINGER

YOUR INTEGRATED SERVICE PARTNER.

WELCOME TO THE NEW BILFINGER UK.

We are delighted to announce that global engineering group Bilfinger has merged its two core UK entities to create a new €400 million turnover business, Bilfinger UK – a leading integrated engineering and industrial services provider.

With over 4,500 employees and 14 locations across key industrial hubs, Bilfinger UK is the partner of choice for engineering, automation, and asset management services to a range of markets, including chemical & petrochemical, nuclear, oil & gas, pharmaceuticals & biopharma, power & energy, utilities, renewables and food & beverage. Our single-source approach enhances the efficiency of assets onshore and offshore, ensuring a high level of availability, and reducing maintenance costs throughout the entire life cycle. We are driven to succeed through innovative and challenging thinking that pushes boundaries to deliver exceptional performance for our customers.

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