

## GADGET MASTER



## Introducing 2019 EW BrightSpark, Scott Lorimer

As activity increases in response to our call for 2020 BrightSparks nominations, we introduce two of the 2019 winners picked out by Lindsley Ruth, CEO of our partner RS Components, as examples of what is most praiseworthy in today's young electronics engineers

At a ceremony in May the 2019 winners received their trophies from journalist and Arkwright Scholar, Steph McGovern. Here we introduce Scott Lorimer, a graduate naval architect at BAE Systems Naval Ships.

Lorimer says his biggest achievement in engineering so far involved his part in creating a floating capture device (FCD) that would be used to capture unmanned rhibs (rigid hulled inflatable boats) at sea. This was part of a contract involving many industry partners as well as the UK, Dutch and Australian government defence departments.

The FCD had to be redesigned after early testing, to make sure that it would be able to capture a rhib in three conditions, rather than the one he had originally designed it for.

He began by creating the 3D model in Rhino, starting with the structure that would be present in each circumstance.



Lorimer had planned to create three separate products, but when he realised that a lot of the structure was duplicated he developed a system that allowed some of it to be removable, minimising the amount of material required and thus reducing the cost. He built a model and used this to create production and

centre of gravity drawings. The latter was achieved by keeping a weights database, so that he could understand the weight and centre of gravity of each arrangement. The production drawings were used by the sheet metal shop to manufacture the three arrangements. Sea tests at the BUTEC Range in Scotland were planned for the summer.

This was the first design project in which Lorimer had a leading role so he came across a number of difficulties during that time, he told *Electronics Weekly*, not least of which was getting his design through his manager's design reviews.

During this project Lorimer says he learned a lot of new technical skills and enhanced others, such as performing structures calculations, creating production drawings, and learning more about 2D and 3D CAD. People skills were needed to liaise with a supervisor

in the sheet metal shop, and he had to consider factors such as cost, materials and metal sheet sizes, lead times, employee hours available and time planning.

### Community/STEM

Lorimer is a Stem ambassador through his work and has taken part in a number of events. For example, he recently attended a careers fair at Johnstone High School with BAE Systems.

The company was there to promote its apprenticeship scheme to secondary school children.

Lorimer also gave a presentation about design methodologies to about 100 students at Glasgow Caledonian University.

He has also given talks at his former school, Montrose Academy, to students who were interested in going into engineering.

## Meet another BAE Systems 2019 BrightSpark, Craig Dickson

Also awarded a BrightSpark accolade in May was Craig Dickson, an aerospace engineering graduate. He is also employed at BAE Systems and was singled out for praise by Lindsley Ruth.

Dickson described completion of his master's thesis as his biggest achievement in engineering: it was a nine-month individual project which involved extensive collaboration with academics from all over the world.

The work describes the theoretical analysis and optimisation of a forced convection heat exchanger. The solid part was modelled as porous media of varying thickness relative to the full channel width, while the liquid was defined as a copper-water nanofluid; a suspension of tiny copper particles.

The aim of the theoretical work was to create mathematical models that describe

how heat transfer is affected by varying nanofluid concentration and porous insert thickness. Parameters such as entropy and Nusselt number were used to define optimal configurations. The work was also done numerically using computational fluid dynamics to validate the mathematical models.

The work won Dickson the IMechE Medal for best final year project in a mechanical engineering discipline and he wrote it up for academic journals.

The project has a wide area of applicability – BAE Systems is looking at how to increase the efficiency of its cooling systems on the Type 26 frigate, for which this has been discussed as a possible solution, as well as possibly next-generation ships.

Like any project with international stakeholders, communication was a



challenge, said Dickson, who used Skype conferencing with colleagues based at opposite sides of the globe.

The complexity of the work forced him to develop a multi-tasking approach that paid dividends when calculating the Nusselt number, with which he struggled

for at least two months, he said. When he solved it and showed his supervisor he was told that two PhD students had given up trying to solve the same calculation.

### Community/STEM

In 2018 BAE Systems supported a country-wide tour to celebrate a century of the RAF. Dickson was involved in a well attended three-day RAF 100 public event in Glasgow, taking guests through the cockpit of a Eurofighter Typhoon and being an ambassador in the BAE Systems STEM tent.

He also doubled as the Strathclyde University Strategic Partnership Lead and had conversations with educators and the Mayor of Glasgow about how best to increase STEM engagement in young people.

# Absolutely positive

As we continue our quest to find the EW BrightSparks of 2020, Lindsley Ruth, CEO of RS Components, which has partnered the programme, since its inception in 2017, talks to our editor, Clive Couldwell, about the value it brings to UK electronics



### How does EW BrightSparks fit in with the RS Components vision?

Perfectly. Our world is changing fast. We live in an environment where more of our lives are automated, connected and supported by electronics: healthcare, transport, home automation, IoT, to name a few.

Engineering is the most exciting industry to be in today.

A strong engineering sector is vital to the future of the UK and the global economy. The contribution of engineering enterprises to the UK economy is significant, generating about 23% (£1.23tn) of the UK's total turnover.

We need to address the shortage of engineers in the UK before it has a negative impact on the economy. RS recognises the need to inspire and encourage young people to enter the engineering profession. That's why, as part of our Corporate Responsibility vision, we started our STEM outreach programme three years ago.

Last year, we expanded it significantly and we now have 150 STEM ambassadors. We also support a host of additional activities and programmes targeted at inspiring the next generation, from schoolchildren through to post-graduates.

Engineering presents a huge opportunity for young people today, enabling them to contribute to the economy and to make people's lives better, more efficient and more entertaining.

Initiatives like EW BrightSparks will inspire younger people to choose STEM subjects and pursue a career in engineering. RS is delighted to partner with *Electronics Weekly* once again in EW BrightSparks 2020.

**What change have you seen, across the years, in the entries we have received for EW BrightSparks? Are they more entrepreneurial, or more community-minded?**

Both. The percentage of entries from young engineers already in employment has steadily increased, reaching a record 83% in 2019.

Consequently, we are seeing entries from a broader range of industry sectors, including industrial components manufacturing, communications, automotive, aerospace, defence, audio and more.

Increasingly, entrants have a more complex and varied skills base – including new technologies such as IoT – and are fast picking up ‘soft skills’ such as project management and team-working.

Another trend, as one might expect from young people, is a greater use of social media and crowdfunding to get projects off the ground. This was first evident in start-ups but is now happening for specialist projects within larger corporations.

Simultaneously, there is a significant increase in the number of entrants who are STEM ambassadors, which in 2019 represented 71% of the total. Many contribute to additional community and educational programmes.

Importantly, the percentage of female entrants has increased and in 2019 reached 43% of the total.

Happily, STEM and other industry campaigns over the last few years are beginning to have an impact. But it’s everyone’s job to make sure that more women start – and remain – in engineering: from the toys parents give their children to play with, through to images used in university prospectuses, to the support that we give all employees throughout their careers.

**What have we learned from decades of electronics R&D?**

It’s a cliché, but: the only constant is change. It’s human nature to resist change. But in the technology world, standing still is not an option.

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LINDSLEY RUTH



We have to embrace change, adapt, and evolve swiftly. Radiospares, launched in 1937, changing its name to RS nearly 50 years ago. RS has long been renowned for high quality and service excellence – and that hasn’t changed, although with the digital revolution, virtually everything else has.

The UK has always been an entrepreneurial nation, but this spirit has been subdued in the recent past. Today, we urgently need to re-ignite it and stimulate a new wave of innovation from the electronics industry. My own inspiration was my grandfather, who started a distribution business. He taught me the importance of always looking forward and the need to innovate continuously.

Innovation can be scary for established businesses, experimenting with unknowns, taking risks. To help them adjust and embrace innovation, we launched DesignSpark almost 10 years ago, providing engineering resources and tools, including electronic, electrical and mechanical CAD packages, along with technical

forums and workshops. With a strong focus on disruptive technologies, we have succeeded in attracting more than 800,000 engineers to the DesignSpark community – all keen to learn something new – to be the disruptor and not the disrupted.

Anticipating the future, the outcome of electronics R&D, is key to our success in meeting our customers’ needs. We are aware that we are at an inflection point in our industry. The IoT and Industry 4.0 will touch virtually every market and all aspects of our lives, and RS will be part of it.

**Any personal stand-out moments from the EW BrightSparks programmes down the years? Maybe student examples that stand out for you?**

Many. BrightSparks continues to amaze me with the quality of young engineers entering. I’ve been quite impressed by a number of the candidates, for their sense of spirit and entrepreneurship. They’re not afraid to take risks.

I found it very encouraging that so many of them find time to volunteer as STEM ambassadors and help with community projects. There’s no single winner, and all the finalists are remarkable in many aspects. But here are a few who stand out:

■ From day one of his new career with GB Electronics, after graduating in electronic engineering, 2017 finalist, **Alex Croucher** showed an extremely high level of technical competence. In addition, he demonstrated an innate ability for project management, plus displaying superior teamworking and client-facing skills. Who says engineering graduates lack ‘soft skills’?

■ 2018 finalist, **Orla Murphy**,

gifted in maths, science and music at school in Ireland, gained a degree in electronic engineering and music. This allowed her to study topics she loved before launching into a career at Jaguar Land Rover working on vehicle entertainment systems.

She said: “As an engineer I could be designing a new audio system for a vehicle one day, and the next looking at how sensors can make a car safer. Engineers are problem solvers which is why I find my career so fulfilling.”

■ 2019 finalist **Scott Lorimer** has already demonstrated not only the application of technical and academic knowledge to practical projects at BAE Systems Naval Ships, but he has also successfully steered his way through all aspects of the product lifecycle in a short space of time.

The project requirements changed weekly, while keeping up with deadlines, budgets and costs, material lead times and liaising with other departments ensured he developed project management and effective communication skills. And he is an active STEM ambassador.

**Do individuals still have a significant role to play in this time of globalisation and fast-moving technologies**

Absolutely. There is massive potential for individuals to make their mark, (not only the young), providing they are prepared to embrace innovation. This is the case not only in traditional engineering sectors, but particularly in fast-moving markets such as healthcare, home automation and environmental monitoring, exploiting emerging technologies including AI, cloud computing and IoT.

Here are some more BrightSparks examples:

■ 2017 finalist, **Robert Green**, graduated from Loughborough University with a degree in mechanical engineering. He was already putting his knowledge to work to pursue his ambition of helping make life easier for handicapped people, with his first placement.

Recognition for his achievement helping paralysed people to communicate led to a new commission, plus an invitation to join the university’s research team to develop an augmented communication device that converts breathing patterns into speech.

■ 2018 finalist, **Rachel Wong**, from Malaysia, is a tissue engineer at UCL Institute of Child Health. She works with stem cells and is building a bioreactor to grow eyes and to contribute towards research into blindness.

She has a busy schedule and is passionate about engineering. She excels in destroying the stereotype image of an engineer. She dyes her hair in rainbow colours and her hobby is making jewellery that lights up, demonstrating that engineering is as fun as you make it.

She said: “I’m nerdy, I work in a lab in a lab coat. But you don’t have to be boring to do that.” She has also successfully crowd funded to invest in materials to set up and run wearable tech workshops.

■ 2019 finalist, **Craig Dickson** had as his master’s thesis, ‘The theoretical analysis and optimisation of a forced convection heat exchange’, achieving results that had stymied previous PHD students.

Now working for BAE Systems, the work he produced has been discussed as a possible solution for increasing the efficiency of cooling systems on board the Type 26 frigate.

**Any tips to entering or what you look for in an award-winning entry?**

Certainly. Academic achievement and the acquisition of technical knowledge and applying it in practice are important, of course.



Demonstrating an entrepreneurial spirit with a clear focus on innovation and efficiency will ensure a second look. Showing the confidence to take a risk, to grasp opportunities, to think laterally, and to push the boundaries to make things better: these are admirable qualities.

I have been most impressed with several projects working to improve the quality of lives of people who are disabled or underprivileged. Engineering is also about understanding the environment in which a product, device or application is going to be used

and who is going to be using it.

But the brightest sparks will also show an aptitude to adapt rapidly to the practical realities of product development, from concept to deployment.

While there are opportunities for individuals to shine, team working will be critical to success.

Finally, a sense of community is important too. Young engineers, more than anyone, are best placed to encourage more young people into engineering, through STEM and other initiatives. Just being out there and

demonstrating that engineering can be a fun and fulfilling career will help bury the outdated stereotype of an engineer.

**Looking forward, have you any advice for emerging generations?**

Technology is an integral part of almost every aspect of our lives: at home, at leisure, at work and on the move. And engineers are responsible.

Engineering skills have become essential in virtually every industry. According to *EngineeringUK*, by the year 2024 the UK will need an additional 186,000 skilled engineers each year, just to maintain the status quo. Already nearly 20% of the UK workforce is employed in the engineering sector – and not all enterprises that employ engineers are registered in the engineering sector.

If schoolchildren today want to do their bit towards mitigating climate change, then science is critical.

If they are only (at the moment) interested in electronic games or social media, then technology is the thing.

Engineering is key to fast growing markets such as environmental monitoring and pollution control, as well as medicine and healthcare. And mathematics is relevant to any role in any aspect of engineering.

Today’s brightest young engineers will tell you that being curious and innovative and having the confidence to take risks can make engineering fun. It is varied, and can help people live better lives.

However, according to Dell Technologies, 85% of the jobs that will exist in 2030 haven’t been invented yet. But no worries – engineers are problem solvers and can embrace change. The STEM subjects will ensure that today’s youngsters will be prepared for whatever the future brings.

And RS, itself being agile and responsive, will surely still be here to inspire and support innovative engineering. □

To see profiles of all the previous winners and nominate a candidate for the 2020 EW BrightSparks go to the website at: [www.electronicsweekly.com/brightsparks](http://www.electronicsweekly.com/brightsparks)