Foreword

Professor Julia Buckingham
Vice-Chancellor and President
Brunel University London

I am delighted to provide the introduction to the Co-Innovate book – which illustrates how companies and universities can work successfully together for mutual benefit.

For us at Brunel University London collaborating with employers is at the centre of our work. Everything we do is underpinned by our employer links which as this book demonstrates are varied and strong. We are also clear that we have a responsibility to support SMEs within our region and we will continue to bid for funds from the European Union, Innovate UK and elsewhere to be able to provide the services our smaller business partners need.

Importantly, the examples of collaboration outlined here are not one-off activities but are rather the first stage in a developing relationship. All of this work represents university-company engagement and results in new collaborative projects, funded R&D projects, placements and internships and the recruitment of our graduates.

Our staff and students are providing real value to the businesses they have worked with and I believe there is an important message here: the work our students do for companies is not a matter of them just trying out things or undertaking abstract exercises, rather they are applying their skills and know-how to projects that will lead to bottom-line enhancements for those businesses.

Many colleagues from across the University have been involved in making Co-Innovate a success and I am grateful to them for all their efforts and ingenuity; but I also want to thank the 260 companies who have worked with us over the last two years and who we are now pleased to consider our partners.

Finally, Co-Innovate could not have taken place without the support of the European Regional Development Fund and I would like to record my thanks to the management team at the Greater London Authority (GLA) for their help and guidance in delivering the project.

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co-innovate

What is Co-Innovate?

True to the innovative practice of our namesake Isambard Kingdom Brunel, Brunel University London is forward-thinking in recognising the potential of collaborative innovation. We call this co-innovation.

Co-Innovate was established at the end of 2012 as a two year programme, funded equally by the University and the European Regional Development Fund, to support innovation within London-based small and medium-sized enterprises (SMEs). Over the programme's two-plus years, we have worked closely with over 260 companies, providing innovation support to 150 and more in-depth collaboration with 45.

The University and the Co-Innovate team believe in the value of this partnership and its vast potential to go well beyond the direct economic benefits to the companies involved. It is through these different types of pioneering collaboration that our co-innovation and surrounding ecosystem is an exemplar of how universities and businesses should be working together to maximise benefits to the economy and to society as a whole.

About this book

As the first phase of the Co-Innovate initiative comes to a close, we present a book to explain and showcase the work carried out between a fascinating range of London SMEs and a group of energetic and talented business people, students and University staff. This is a lasting way to ensure that the demonstrably positive results of the last years are passed on, sustaining collaboration for the future.

In the following pages we cover the background to Co-Innovate, celebrate some of our most successful collaborations and show the three main ways we work through collaborative student projects, academic expertise and workshops and events. In the final section of the book we look forward to what's next for Co-Innovate, the University and our innovation ecosystem.

The Innovation Imperative

Andrew Ward
Director of Corporate Relations, Brunel University London

Britain has a choice: we can play to our strengths or we can turn our back on them. We have the best cultural industries in the world; our brands - including the brand of being British - are still admired and valued across the globe; we have - by any standard - today's leading innovators. These advantages must be continuously nurtured and cherished. Design, innovation and new manufacturing are the pillars that will assure the prosperity of our nation.

Prominent individuals - such as Sir James Dyson - and reports commissioned by each of the last three Governments talk about the need for an 'innovation ecosystem' to promote economic growth. Over the last two years, through engaging with 260 businesses and working intensively with 40 of our sub-region's best companies, we have attempted to do this: create an 'innovation ecosystem'. Co-Innovate, funded by the University and the European Regional Development Fund, has brought together London SMEs, academics and students to collaborate on projects and activities that will result in new products and services, and crucially, additional jobs and bottom-line enhancements.

But this engagement is not a one-way street: we are in the business of knowledge exchange rather than knowledge transfer. Our students and staff obtain positive benefits from working with business partners. For example, these collaborations provide academics with research material and outlets for testing new technologies; they can help us secure R&D funding; provide our students with an effective learning experience boosting academic and employment prospects; and demonstrate the University's role as an 'anchor institution', adding value to business communities.

Co-Innovate is not a stand-alone activity at the University but is linked to a suite of provision that includes the Ready Programme, orienting 1st year students to exercise the attributes they need to be effective learners, employees and entrepreneurs; the on-campus Innovation Hub, encouraging entrepreneurship and enterprise skills; Made in Brunel, our renowned, student-led, annual Design showcase; our other student showcases, Brunel Engineers, Brunel Digital and Brunel Software Engineering and Making the Future – the major project we are undertaking to develop a custom-designed innovation centre: the Central Research Laboratory at the Old Vinyl Factory in Hayes.

This book nudges us to think about what counts as world-class learning in higher education. It outlines the fruits of the Co-Innovate collaborations and also indicates a kind of route-map that others might wish to follow. I will be strongly recommending my colleagues that they keep a copy of it close by and keep firmly in mind the innovation imperative.

Importance to the London economy

Frank Wingate
Chief Executive, West London Business

West London's diverse £37 billion economy, second only to the City in economic importance, contributes some 20% to the capital's total GDP. Powered by major economic drivers like Heathrow, Park Royal, the Golden Mile and the BBC creative cluster, West London is home to strong industry sectors such as transport, logistics, hospitality, IT, pharmaceuticals and financial services. While the area accommodates some of the world's major brands, it is SMEs that make up 99% of London's economy operating through robust competition and continuous innovation.

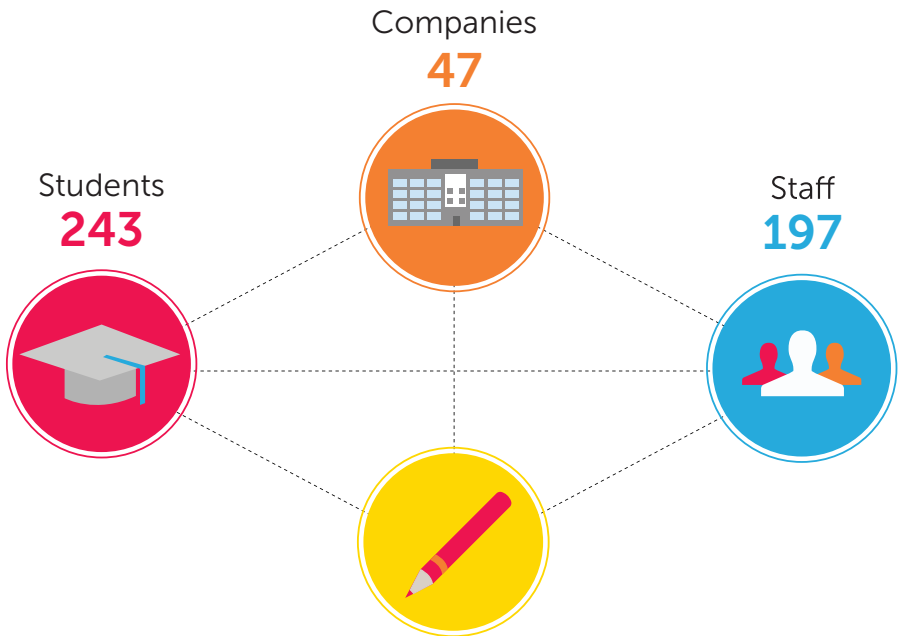
Continuous innovation is critical in today's global economy, but difficult to achieve with the limited resources and support that companies with fewer than 250 employees have access to. This is where collaboration between SMEs and universities offers a solution. The academic and practical potential in our education system, whether research expertise, the talent pool of students, or leading technical facilities, can supply businesses with the right tools for product development and further growth in the private sphere.

As a Chamber of Commerce we consider one of our main roles to be a broker bringing together businesses and Higher Education for mutual benefit. We are pleased, therefore, to have supported the Brunel University London and European Regional Development Fund's Co-Innovate initiative, which has successfully energised many West London innovation projects and proven a catalyst to growth and job creation.

The Co-Innovate Dashboard

Over 33 months our focus on collaboration, supporting innovation, growth and employment generates a considerable amount of data. In total there have been over 30,000 hours of collaborative activity, explained in more detail over these two pages.

COLLABORATIONS



Up from 27 in 2014

Collaborative projects completed	68
Crowdsourced projects	3
Academic engagement projects	9

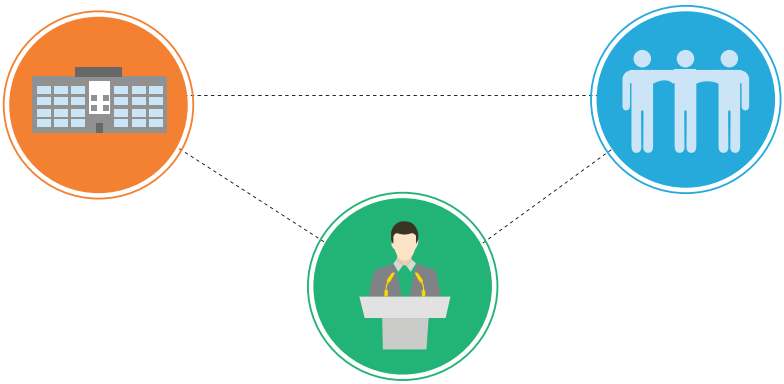
EVENTS & WORKSHOPS

Companies receiving 12+hrs support

150

Attendees

1500+



Total number of events run **211**

Hours of support provided **2,520**

01

AWARD WINNERS

We are extremely keen to highlight the ingredients of successful collaborative innovation. It seems to us that there are very few award schemes which honour this important combination of collaboration and innovation - surely the essence of so many success stories from around the globe. Therefore our inaugural awards are founded on celebrating Co-Innovation.

Co-Innovating

Award Winners

Andrew Ward
Director of Corporate Relations, Brunel University London

We are very keen to highlight the ingredients of successful collaborative innovation and recognise those businesses who have been particularly impressive co-innovators. So from the 45 London SMEs who have developed in-depth collaborations with us, we have selected three outstanding examples. In doing so, we applied three simple criteria. Firstly, the level of enthusiasm they demonstrated for the practice and possibilities of co-innovation. Secondly, the extent - in terms of hours, projects, placements and other forms of engagement - of the co-innovation. Finally, and in line with Co-Innovate's ultimate goal of enhancing the London and UK economy, the actual or potential economic impact resulting from the co-innovation.

Our three award winners are superb ambassadors for what can be achieved and we are pleased to pay tribute to them.

An apt message written on the walls of award winner Astudio's headquarters.

we listen
we share
we innovate
with courage

Astudio

Nominated by Ian Ferris, Co-Innovate Innovation Director

Astudio are an award-winning architectural practice focused on having a minimal environmental impact. However when creating building designs that have a low carbon footprint, commercial viability poses a challenge.

This is where Co-Innovate provided assistance: helping the company develop a roadmap for building product development capacity and realise their growth ambition. Using the skills, knowledge and resources available through Co-Innovate, Astudio were able to hone their vision through a set of projects with staff and students at Brunel University London.

Co-Innovate is not a chemical process, rather it is about what businesses are doing, and more importantly, where they are trying to go. By linking to universities, SMEs can gain access to innovative activities and deliver results. This is not about resources, but knowledge exchange.

Astudio has illustrated this mutual partnership by obtaining help from specialist academics, expert product innovation mentoring and various connections gained with other Co-Innovate network members. Additionally, projects with design students focused on new product solutions - for

instance Algae façade systems, low-cost housing modular systems, were paired with the Business School to look at commercial feasibility and market entry.

Access to funding such as the Co-Innovate 'Innovation Voucher' also assisted Astudio with new knowledge in Biomimetics and Computer Science, enabling them to appropriately utilise new technologies and processes.

Design awareness to technology and processes requires very high degrees of creativity, often exemplified at universities like Brunel. For large businesses, there is time and capacity to liaise with these resources, but for SMEs innovative solutions and strategic thinking are difficult to obtain.

This illustrates what can be achieved when a business with a big vision embraces collaboration to achieve their objectives. It is because of their use of different elements of the innovation ecosystem that Astudio are one of our Co-Innovate Award Winners.

Most importantly, this will not be a one-off event, but the start of a longer term productive relationship with Brunel. The relationships and network Astudio have developed through Co-Innovate will sustain their innovation efforts in the long term, as well as resulting in the creation of a new generation of sustainable building systems.

Design students Chris (left) and Ray (right) have been working in collaboration with Astudio this year.

Fuse

Nominated by Paula Neal, Co-Innovate Project Manager

A reciprocal business partnership, one that's both professional and positive, is exactly what the Co-Innovate programme advocates. Toy SME Fuse has embraced this type of relationship by exchanging views and agreeing on common goals with Brunel University London.

Having started links with Brunel by offering internships to students, Fuse's commercially focused outlook has helped the young innovators who work for them prepare for professional life. Simultaneously, the University opens the company's eyes to other parts of business development through the diversity of its academic programmes.

"FUSE is one of the few toy development companies that just do invention," said company director Pete Cartlidge. "It's a risky business but we've been successful."

Short product life cycles and high failure rates for new ideas can make licensing an invention with a major toy brand difficult. Fuse has benefited from good demand for ideas from the US toy market. Their approach of presenting prototyped concepts gives additional credibility to their pitches.

"It's crucial that inventor groups like Fuse add value otherwise big companies will stop looking for outside innovation," said Pete.

Fuse wanted to license and patent inventions for a 2017 introduction, with particular focus on tech-oriented toys. 3D printing, usually used for prototyping but now moving into mainstream applications, was one of the new opportunities the company was eager to explore.

"The 3D printing brief was an example of how we identify trends and meld our own commercial product ideas," said Pete. "What was of interest to us was having the end user interact with a 3D printer to create the product that they'd want."

Peter Sheppard, a student in Product Design, studied 3D printing in his Brunel course.

"Fuse helped guide my research and suggested places I should go, people to meet, and events worth attending," said Peter, now working as a graphic designer for global events company 3D Printshow. "Their direction continued throughout the project and it was incredible to receive their experience of the market and industry."

The outcome was Dawn of the Imagimals - a software platform allowing children to create their own toys. Simulating a game scenario, the project is currently under review by a major multinational toy company.

"One of the reasons why we're so well matched with Brunel is because the students there are well schooled in new technology and adapting those new technologies to their own skill set," said Pete, a regular speak at Brunel events. "It's a good reason why we keep going back."

Top Left: It's all about toys at Fuse's studios in West London.

Left: 3D-printed Dawn of the Imaginals, designed by Peter Sheppard

Aether Lighting

Nominated by Stephen Green, Co-Innovate Project Leader

Aether Lighting is a proudly British company in the competitive sector of architectural lighting. Aether differentiates itself by building strong partnerships with specifiers of their products, such as architectural practices and building service consultancies.

Over the past two years, this successful philosophy has encompassed working closely with Brunel University London design students. Having been directly involved with a number of Brunel's collaborations in the lighting sector, I have been massively impressed with how Mark Ayers, Aether's Managing Director, has enthusiastically embraced the potential of working with the next generation of design professionals.

"When you're a small business like we are, quite often there are things that need doing but you don't have the resource for it," said Mark, who's company now has an approximate turnover of £1m.

"At Brunel, they've got some really talented individuals, both staff and students, who might not promote their expertise to SMEs themselves, but Co-Innovate does."

An LED spotlight: part of the Tektar range, is the result of Tom Campion's year long placement and nine month final year project.

Ultimately Co-Innovate is concerned with making an impact. This impact can be considered in a number of different ways, and having looked at the results, Aether scores highly in a number of areas.

This year I had the pleasure of taking part in the academic supervision of Tom Campion's collaborative project with Aether. As a Product Design student, Tom undertook a year long work placement, providing Aether with an intelligent, highly motivated, technically competent and cost effective resource. Tom's increasing interest in the lighting sector and links with the company, led to establishing a brief for a range of LED powered spotlights, which would form a new range; Tektar, expected to increase Aether sales annually. In addition to which, and at least as important as a new company product; Mark has re-employed Tom as a Senior Lighting Designer.

Tom is just one of an ongoing series of placement students. Rebecca Hodges, who did her student placement with Aether in 2012-13, has gone on to work for London lighting consultancy Paul Nulty Lighting. Tom Harries, who worked on a collaborative student project for LED retail and gallery lighting with Aether in 2013-14, is now working in London for the UK office of Fagerhult, one of Europe's leading lighting companies.

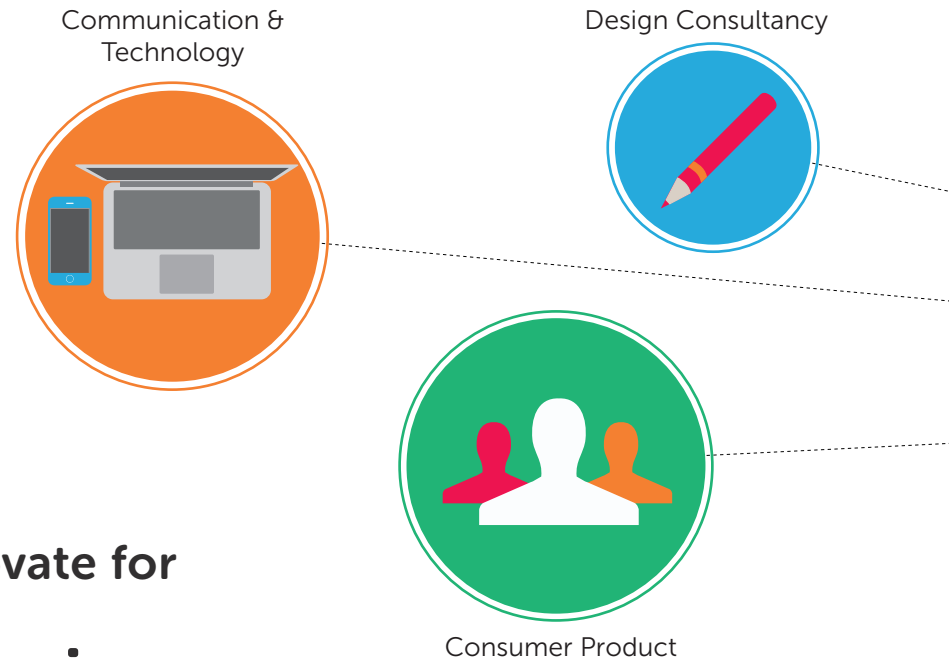
"Mark was a great partner in respect to creative and progressive feedback," said Tom. "We met up every six weeks or so to discuss the project, and I had use of his in-house staff to help with certain aspects. I would say it definitely helped in acquiring my current job."

These are all benefits from collaboration. Aether benefits from employees and new products. The Brunel students and graduates benefit from invaluable commercial experience and career opportunities. The London economy benefits from the vibrant lighting business sector. The sector as a whole benefits from a new generation of highly trained lighting designers.

02

OUR STORIES

A wide range of companies including Sony, Heinz, Rolls Royce, Procter & Gamble as well as many London SMEs have recognised that collaborations with Brunel students can contribute to their business and develop future employees. Read some of our success stories in this section.

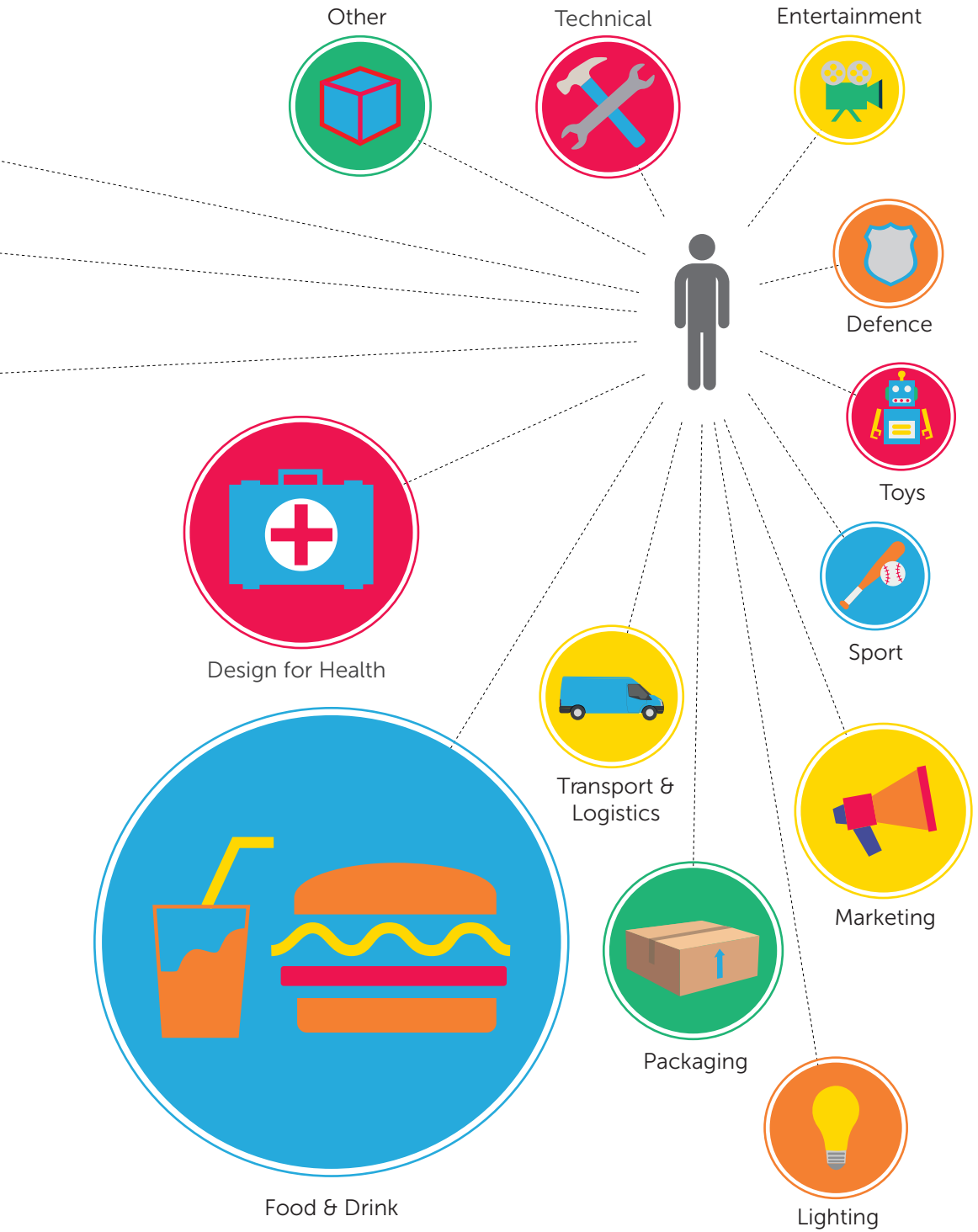


Co-Innovate for

Nurturing Opportunities & Talent

Brunel University London is home to over 10,000 undergraduate and 4,000 postgraduate and research students from the UK and around the world; soon to be the future generations of employees, entrepreneurs and leaders of organisations. Co-Innovate allows companies to benefit from this talent resource in an increasing number of low risk and tailored ways, while enhancing student learning. Collaboration might involve crowdsourcing concept ideas, product design challenges or service development. Whether working with an individual or group of students, a wide range of companies recognise that these collaborations can contribute to their business and develop future employees.

Proportions of the student contributions across a range of business sectors


Other
Technical
Entertainment
Defence
Toys
Sport
Marketing
Lighting
Packaging
Transport &
Logistics
Design for Health
Food & Drink

Organising placements and collaborative student projects

Brunel University London has 50 years of experience setting up student placements and in the Placement and Careers Centre has 30 staff dedicated to working with companies to facilitate placements, internships and graduate recruitment.

A comprehensive range of services are provided to industry including recruitment advice, organising careers fairs and company visits, free advertising for vacancies and partnering with skills development workshops. Co-Innovate's tailored approach to setting up collaborative projects is based around the three types of collaboration below.

All potential projects and the intellectual property arrangements are carefully discussed with the partner company, whilst the students are supported and guided weekly by their supervising tutor.

Undergraduate projects
400+ hours
October to May

Postgraduate projects
600+ hours
April to September

Group projects
10 - 100 hours
Autumn or Spring

UNDERGRADUATE PROJECTS

JUNE

Review and refinement of industry briefs

JULY

Deadline for final industry briefs

SEPT

Allocation of students to project

OCT

Project contracts to be agreed

NOV

Industrial Review Evening

APRIL

Students complete projects

JUNE

MADE IN BRUNEL exhibition

SEPT

POSTGRADUATE PROJECTS

JAN

Present projects to students

FEB

Deadline for final industry briefs & project selections

APRIL

Research plan deadline

JUNE

MADE IN BRUNEL exhibition

SEPT

Students complete projects

Jones & Partners

The first time he entered a design studio, Craig Jones remembers using magic markers. Now, the process of design has taken a new face, one considerably more fast-paced.

Designing for the home is the specialty of Jones & Partners. The London-based SME creates a wide-range of products, from chairs and tables, to storage space and lighting structures. The company has repeatedly teamed up with Co-Innovate, producing commercially viable results.

"Business technology changes daily and it is good to have young people in the office to keep you on your toes," said Craig Jones, founder of Jones & Partners design practice. "At Brunel, there is a high level of ability to do what today's technology is capable of and a high level of education in regards to working with businesses."

Founded in 2000, Jones & Partners produces products for places like Herman Miller, Deadgood, KI, Connection, Cambridge Park and Thinking Works. The company has been involved with Brunel University London and its Co-Innovate initiative for three years, including several successful

collaborations and one employee gained - Paul Scopes.

"You get to work with a student and see whether they fit within your business and if their skill base fits before hiring them," said Craig. "Regarding Paul's case, we could get on with him and his way of thinking was natural for our business."

New product design geared toward the office market was another benefit. Student Alex Godbold created a way to grow fresh microgreens indoors. Patch, is a disposable and biodegradable pod, which allows on-the-go consumers to enjoy healthy food without much effort. Using materials science, Alex carried out extensive growing experiments and materials testing to deliver nutrient substantial greens that would grow in office environments in ten days.

"Jones & Partners opened their doors, giving me full access to all the facilities they had. These included a fully kitted out workshop, 3D printers, top-end design software and the help and guidance of their brilliant in-house designers," said Alex, currently working as a retail designer in London.

"This support enabled me to get the most out of the project and ultimately succeed."

Brunel Design focuses on solving problems. Patch was an engaging way for consumers to adhere to healthy and sustainable living, while allowing a company to experiment with different ideas.

Patch, designed by Alex Godbold enables on-the-go consumers to enjoy healthy food

Mixed Freight Services

A report by Regeneris Consulting has predicted that expansion of Heathrow Airport could be worth up to £300 million a year by 2040. If this is the case, innovation will be a necessity for the SMEs and surrounding industry affected.

The aviation sector in which cargo screening and delivery company Mixed Freight operates is surprisingly traditional. A combination of legislation, long-term employees and the demands of security screenings gives the company limited time to advance its operations.

"We come from an industry which has employed people from 16 to 17 years of age," said director Steve O'Keeffe. "We have very few people that come through the university pathway. Modern learning is a side for our company to explore." Steve had gone to Brunel University London to see how he could access its academic prowess and what potential there was to enhance the company's management capacity.

Co-Innovate helped connect the company with Business Masters student Felix Doepke. Felix highlighted operational constraints and future marketing strategies through observation, data analysis and a dissertation representing 600 hours of work.

Felix, now working as a strategic management consultant at Accenture in Norway, had learned a lot about the logistics sector during his major module and was able to apply theoretical knowledge to practice.

"In the job interview [for Accenture] I could tell them spot on examples of why I think consultancy is the right thing for me and which capabilities I have developed to bring to the firm," he said. "After employment, my boss also told me that my good internships were an important reason for employing me."

In the 2015 Lloyds Bank UK Business Digital Index, 1.2 million British SMEs still remain without basic digital skills. Mixed Freight has continued working with other Brunel students to bring the company to digital maturity. Sean Sweeney was one of them.

"I attended a Co-Innovate digital marketing course, which Sean attended at the same time," said Steve. "This gave us a fantastic start to the project. We bounced ideas off each other and he got to learn about me very quickly. That's like any of these projects - it's what you put in that you get out."

Sean agrees: "The result of working on all these tasks has greatly improved my commercial awareness, business etiquette, interpersonal skills and my employability," he said, now working full-time with the company until he finds the ideal next step for his career.

Online marketing is a relatively new concept in Mixed Freight's sector. With Co-Innovate, the company has taken steps forward with web development, advertising and social media presence.

"The key with Co-Innovate is that it brought a sense of learning back into the company and opened our eyes. If you've got students with you, you're teaching and learning all the time so you don't make a mistake."

Steve O'Keeffe, Director, Mixed Freight

Brompton Bicycle

Becoming the UK's largest bicycle manufacturing company is no easy feat, and Brompton Bicycle has achieved this after 40 years of hard work.

Brompton Bicycle manufactures folding bikes for people all over the world from their factory in West London, using customisable parts to develop a bike that suits all their customer's needs. The Brompton was conceived as an innovative product that increases people's sense of independence and freedom - a concept still at the heart of everything they do.

"I would say Brompton are quite a special employer; ingenious engineering is in the blood of this company which makes it a fascinating place to be," said Eleanor Rogers, Brompton's Product Design Engineer.

"Brompton has a good sense of its own identity, and it wants to stay a London company doing things thoroughly."

Eleanor is a Brunel alumna. She works with a team developing new functions for the Brompton bike, which has helped the company produce high-quality products with thriving profitability.

Eleanor has been working in collaboration with Brunel design student Rob Lancaster (pictured left) on the exploration and development of a new bike accessory concept for Brompton bike riders. There is considerable competition in the bike sector and the value of innovation is well recognised. For Brompton it is part of the DNA, which has given Rob a difficult challenge. The collaboration has also been a way for Eleanor and her colleagues to develop new ideas in parallel to the day to day pressures of a highly successful company.

Eleanor's own work closely mirrors the skills Brunel designers are developing.

"In my job I help refine the brief and research the project, generate concepts in sketches and models, test and evaluate proof of principle prototypes, validate the design on alpha prototypes, and eventually move on to a small engineering build of bikes for ride testing," she said. "I also do all the engineering drawings for the final design and work with our suppliers throughout to make sure that what I'm designing is feasible."

Eleanor's not the only one who believes in this way of thinking.

"That attitude runs through to how it treats its staff; it is important to Brompton that people are looked after fairly."

"Many staff have their own Brompton, so we keep a culture of being very close to the product and knowledgeable about it."

The company has ambitious plans for future developments including a recently opened Brompton Junction store in Bangkok, new creative projects set for 2016 and an ongoing need for the range of people and expertise that Brunel can offer.

Sound Forms Ltd

Veil is a lighting product prototype designed by Brunel student James Ward for a UK-based SME that's redefining outdoor performances with revolutionary acoustic shells.

A unique acoustic panelled system creates a superior acoustic environment for performers on stage and provides significant sound projection towards audiences, housed inside a beautifully designed tensile structure; Sound Forms Ltd is the world's leading outdoor acoustic stage.

The cutting-edge Sound Forms Acoustic Shell was winner of the Industrial Fabrics Association International (IFAI) International Achievement Award of Excellence in 2012, the World Architecture Festival Awards 2012 and BD Architect of the Year 2014. Product Design BSc student James Ward's prototype provides an elegantly designed lighting product to match the acoustic shell.

Veil mimicks the aesthetics of an armadillo and interacts visually with audio elements.

"Having the chance to develop my computer-aided design (CAD) skills, perform research into embedded electronics and gain access to the

The elegant design of the award winning acoustic stage developed by Sound Forms Ltd.

"The collaboration made the design worthwhile. It motivated me with a proper end-goal."

James Ward, Brunel Design Student

workshop facilities were what I appreciated most from doing the project," said James, now working as a designer for contemporary lighting design installation company LUUM. "They're what I've carried on into my current working life."

Collaboration with an authentic and inventive company demonstrated professionalism to James' present employer. Designing Veil with industry constraints in mind, also prepared him for communicating with clients and manufacturers.

"It remains a work in progress, but we are interested in developing the product with James," says Executive Chairman, Mark Stephenson.

Whilst still in development, there are no current products on the market like the Veil prototype. Sound Forms Ltd may be one step closer to offering their own bespoke lighting to compliment their award winning structures.

Blue Badge Style

The disabled are often overlooked when designing products. Blue Badge Style, with the help of Brunel design students have set out to change this.

Design students from Brunel University London are currently working alongside Fiona Jarvis, founder of Blue Badge Style, to create a new range of wheelchair components and accessories, which are practical, stylish and more varied than those currently available. A disability campaigner, Fiona challenged Brunel's final year Product Design students to address four main design areas: bag, party, chair and rain.

Important aspects of wheelchairs, such as the needs and experience of the users, are often overlooked during the design process, and the details and style are very limited. Small considerations such as ensuring bags can be secured, yet easily accessible, can greatly affect a wheelchair user's day-to-day experience. Another common problem for wheelchair users is staying dry in wet weather, given that it's almost impossible to hold an umbrella whilst effectively operating a wheelchair. Given these challenges, Brunel's students considered aesthetically pleasing and stylish accessories such as wheel covers and practical accessories which would not hinder the user's ability to manoeuvre their chair, to enhance their everyday experience.

The concepts that resulted from this challenge were put to a public vote in December 2014. The most popular items are being made into working prototypes and sent to various companies to consider opportunities for manufacturing and marketing.

Kyle Dawney's answer to the brief was Expression: a set of stylish wheel accessories.

"I would have not been able to develop the research within this time frame and resources without Brunel."

Julia Goga-Cooke, Director of Gconsultancy Innovation

Gconsultancy Innovation

Innovation accounts for 70% of the UK's future economic growth, but investment in R&D remains low. Gconsultancy Innovation turned to Brunel for a solution.

Gconsultancy Innovation is a London-based SME creating collaborative networks for companies to get the tools, skills and learning needed for business development.

In the view of Gconsultancy Innovation, "Networks are at the heart of innovation." The young business sets up online spaces providing innovation education for a wide-range of companies.

This type of knowledge transfer is similar to the innovation ecosystem that Co-Innovate creates. Parallel viewpoints like these, brought Gconsultancy Innovation director Julia Goga-Cooke to Brunel University London's schools of Business and Design. She was paired with students Gerad Gyedu and Fahim Ali.

Studying modern day marketing, Gerad was asked to develop a service that would connect employers with students looking for internships: Myinternship.org. Gerad created the business model and market entry strategy needed. Fahim designed the app for the service.

"I thought this was a unique opportunity," said Julia, referring to interdisciplinary approach of myinternship.org. "I would have not been able to develop the research within this time frame and resources without Brunel."

Both students were able to bring new insights to the company, who specialise in the relatively new concept of organisational innovation.

Gabe & Enid

Wanting to solve problems for parents, brand company Gabe & Enid set student Lizy White a 400+ hour design challenge to get a low cost access to product design ideas.

Growing spurts of newborn babies can mean new shoes every three to four months, making the first years of life incredibly expensive.

Even with the quick turnover in size, children comprise 8% of the global shoe market. In response, Lizy White developed Grow: a child's plastic sandal that can be lengthened and widened to accommodate for the development of the foot.

Speaking about the Co-Innovate experience, brand owner Andrew Dobson said, "I think you've got to be prepared to go in open minded. Certain things change. The idea or the investment level might change so you've got to be flexible and prepared to potentially go in a different direction to where you set out and adapt your plans along the way. Co-Innovate gives you skills and learning to do that."

Press and an evolving brand identity were some of the benefits that came with the inventive Grow product. Lizy was awarded £1,000 and a two-week placement in the Mars Design Studio at the 2014 New Designers exhibition, an annual graduate exhibition show. After awarding Lizy, the judges

said, "This design solves a genuine problem through a clear demonstration of design thinking and deeper exploration of potential solutions. There is great potential for this design to go into production, as well as mass customisation."

Lizy now works as a Product Developer for Flair Leisure Products, making toys and managing a variety of brands. Co-Innovate helped prepare her. "Working with a company provides you with an instant 'get go'," she said. "You have a customer you are working for who provides valuable feedback and direction to your work. The amount of support I received was exceptional."

Brunel University London is widely recognised for its design programmes and fostering industry standard skills. It is also ranked 33rd in the UK for research power by the Research Excellence Framework 2014, so linking this resource to SMEs is a natural step.

"Small businesses are under pressure. I think Co-Innovate is a very good link for support."

Andrew Dobson, Gabe & Enid brand owner.

Lizy White's children's sandal, Grow, was awarded the Mars Award at New Designers 2014.

Smarterkey

From conference calls and instant messaging, to banking and home security, the digital economy is something SME Smarterkey takes notice of.

Homeowners today no longer have to worry about their properties while on holiday. Advances in technology have provided solutions to effectively managing home applications like heating or entertainment centres, meaning that the Home Automation Industry is expected to grow $14.1 billion by 2018, according to ABI Research.

However while technology has provided benefits to homeowners in convenience and cost, homes with an integrated wireless system have yet to be commercialised.

British start-up Smarterkey collaborates with Brunel University London to strengthen its manufacturing skills and investor prospects

Previously Smarterkey created an app that unlocks doors for homeowners, entering the Co-Innovate programme as a software start-up. Recently, they collaborated on a project focused on hardware design: an interconnected home system led by wireless device.

Left: Smarterkey enables landlords to control security as well as monitor heating and energy usage within homes.

"We saw Co-Innovate as a journey to good business practice. Our co-founders had backgrounds in big firm consulting and property. Valuable experience but a start up enterprise requires something extra."

Simon Moss, Founder, Smarterkey

A prototype of a smart hub system, the project targets landlords wanting to easily control aspects of the home such as locks as well as monitoring and controlling room temperatures and energy usage. GSM connectivity allows for the electronic locks and electric heaters to be remotely controlled through text messages and door and heating to be monitored. Using Wi-Fi, locks can be controlled and energy usage, including room temperatures, can be stored and observed over time using a device like a mobile phone.

The experience had a real impact on the company's small team and continues to do so.

"Co-Innovate ran courses from industry experts from subjects as broad as IP to green packaging," said founder Simon Moss, currently looking to gain access to a Brunel engineering graduate through Innovate UK's KTP initiative. "It also opened the door to other resources. Smarterkey were able to access an innovation grant to develop our design capabilities working with an experienced design professional."

Whipsmiths

Go to any festival across Britain, and frozen treats are at your disposal. That is the business of Whipsmiths.

For a liquid nitrogen ice-cream company that creates completely bespoke flavours, innovation isn't a problem. The business' inventive Cyromixer - a machine that churns limitless types of ice cream in 30 seconds - has put the company on the map in the food and drink sector and doubled its turnover each year.

However, with just 16 employees, the time needed to develop and commercialise a product like the Cryomixer, while promoting and expanding the business, puts progress on hold.

"With Co-Innovate I was able to allocate design work and help grow the business," said Whipsmiths founder and Brunel alumnus Brad Smith. "We'd probably be a few months behind as a result."

Already aware of the talent pool available at Brunel, Brad was invited to pitch his brief to 150 final year design students.

One of those students was Tom Potter. He tested the efficiency of the Cryomixer while coming up with performance improvements including a turntable allowing the machine to clean faster, thus producing more ice cream. Tom's developments also aided transportability, which made the Cryomixer more commercially viable.

Tom is now employed as a director of Whipsmiths: "The Co-Innovate initiative definitely got me into my current role," said Tom, who took the job because of the freedom it gave him as a designer. "Whipsmiths were very pleased with what I had done and

Top Right: design student Joanne Hinsley's concept for Whipsmiths' new festival stand. Right: The cryomixer in action.

so I was hired to continue what I started during university. I have since become involved with other projects within the company."

Now using his previous studies like mechanical design and 3D modelling, Tom has the opportunity to develop a machine distributed throughout the UK and internationally.

Whipsmiths continues its reciprocal partnership with Brunel: "It's fresh eyes on the parts and on the business," said Brad. "If we find that one of the students is particularly good, we'll hire them."
Rebecca Ash, another Brunel student, has designed Cryomixer prototypes to take hygiene regulations and efficiency into consideration on a commercial level.

Whipsmiths has found a niche with people who like good ice cream, but some design assistance was needed: "It's a lot easier now for support," said Brad, "Businesses are fighting for students rather than the opposite."

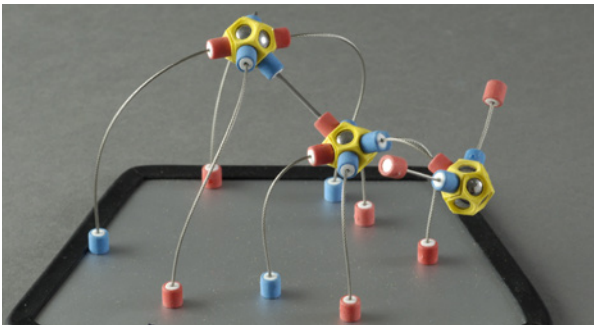
Ormiston Wire

For a manufacturing and supply company, breaking into the retail market provides a number of challenges. Wire specialist Ormiston Wire used Co-Innovate as a step towards new product design.

Whether for hanging lighting in a shop, or the complexities of antennas, Ormiston Wire knows a thing or two about specialist wire manufacturing on a business-to-business basis. But for an employer of 15 people, the company wanted to diversify into new, finished product development.

"We normally provide components for other people," said director Nigel FitzHugh. "and we don't have an in-house product design department to help us move to the next stage."

In the last 5 years constraints on the manufacturing sector have made investment in new products essential for business development, according to reports by IBISWorld. By creating retail products in-house, Ormiston Wire could



Charlotte Coleman's toy concept involves constructing geodesic shapes from Ormiston straight form wire.

diversify its business and face up to market challenges.

Having previously crowdsourced concept ideas with Brunel University London, Ormiston Wire was able to identify potential areas for innovation. Using this knowledge the company collaborated with two design students to pursue the possibility of breaking into new markets - gardening and educational toys.

"We didn't want to make the design briefs too tight," said Nigel. "One was for Vertical gardening and the other was for a construction toy. Both are markets that we could break into."

Charlotte Colman took on the construction toy challenge - constructing geodesic shapes with flexible wire. To solve garden expansion problems, George Clayton created a flexible gardening design using wire, increasing space by having plants grow up a wall.

Working in a real-world setting, the students had to take into account the company's manufacturing capability, designing something around these processes rather than requiring large capital investment.

"You can see in both design solutions that there are links to existing products," said Nigel. "But because they are made of flexible wire they have different properties. I think that it is quite feasible that we could take both products to market."

Even for a well established SME like Ormiston Wire, innovation is key to success. Outsourcing industrial design is a way for an SME to stay ahead and grow.

"I suppose we could have bought in a consultant designer," said Nigel, "But since we are a small business the cost would have been unacceptably high. We're pleased to have been part of this link with Brunel and that both parties are benefiting."

All collaborative student projects

completed between 2013-15

Architecture

Astudio
astudioarchitecture.com
EE Architects
eearchitects.com
London Builders
london-builders.info
Urban Salon Architects
urbansalonarchitects.com

Communication & Technology

Qwince Ltd.
qwince.com
Secured Tech
securedtech.co.uk
Signeer
signeer.com
Smarterkey
smarterkey.com

Consumer Product

BecoThings
becopet.com
Gabe & Enid
www.gabeandenid.com
Joseph Joseph
josephjoseph.com
Suck UK
suck.uk.com

Design

BrandVoice
brandvoice.co.uk
Fuse
fuse.uk.com
Gconsultancy Innovation
gconsultancy.org
Jones & Partners
jonespartners.eu
Jerome Linder
linkedin.com/in/jeromelinder
Ooba Toys
oobatoys.com
Peter Bessey
hothouse-design.com
Therefore
therefore.co.uk

Design for health

Blue Badge Style
bluebadgestyle.com
Motionspot
motionspot.co.uk

Food & Drink

Aara's Organics
aarasorganics.com
TradeMartGlobal
trademartglobal.com
Whipsmiths
whipsmiths.com
we are tea
wearetea.com

Lighting

Aether Lighting Ltd
aetherlighting.com
Light Union
light-union.com
Integral
integral-lighting.com
Soundforms
soundforms.co.uk
Studio of Cinematic Architecture
socalondon.com

Other

Third Sector Potential
thirdsectorpotential.co.uk
Tickler
everyonesticklish.com

Technical

Bio Nano Centre
bio-nano-consulting.com
BTO
btoresearch.com
i2i Companies Ltd
i2ic.com
ISR Iridium Systems and Robotics Corporation
isrcorp.co.uk
Ormiston Wire Ltd
ormiston-wire.co.uk
SolarBotanics
solarbotanic.com
TMD Technologies
tmd.co.uk

Transport

Brompton Bicycle Ltd
brompton.com
Mixed Freight
mixedfreight.com

03

BUSINESS SECTORS

London is recognised as a global creative capital and the creative sector represented £79.9bn (5%) of the national economy in 2013 (DCMS Creative Industries Economic Estimates, January 2015). Recognising the importance of technology and innovation within businesses, Co-Innovate links SME's with exciting collaborative opportunities across the University and the capital.

Co-Innovating with

Key Business Sectors

There are many ways to explore the makeup of the London economy. At a pan-London level, a 2014 CBI survey indicated that 69% of businesses see the technology and creative sectors as key to the capital's continued economic growth. While most SMEs have to be focused on their own individual business sectors, technology and creativity can fuel innovation and development. The Co-Innovate initiative has been able to align Brunel's technical and innovative strengths with a sector-based approach to supporting London SMEs.

The examples on the next few pages show how Co-Innovate links different sector-based clusters of interests with exciting collaborative opportunities.

Right: Co-Innovate events bring together business men and women from a wide range of sectors across the country.

MADE IN HAYES
GUIDE

"The key lies in having a healthy, competitive and sustainable UK lighting industry that can respond to change with agility."

The Rt Hon Michael Fallon MP
Minister of State for Business and Energy 2012-2014

Lighting

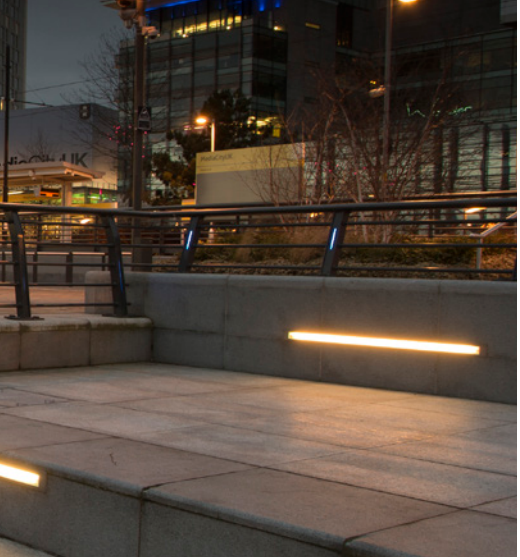
New technology and environmental concerns are major drivers for innovation in the lighting sector not just in the UK, but globally.

Lighting consumes 18% of British electricity, meaning that both light manufacturers and designers must take into account the latest energy saving restrictions implemented by the Government and present through the global demand for lighting fixtures, worth £72 billion in 2013. Changing technology too, means a traditional industry must adapt quickly.

"In the lighting industry a lot has happened in the last 5 years," said Andrew Molyneux of TM Lighting. "Six or seven years ago using LED for lighting was seen as a bit of a joke, but now people don't want luminaires without LEDs in them! Technologies in the lighting industry have come on in a massive way."

The LED revolution - potentially consuming 90% of the market by 2020 - has meant technical and business model changes. A manufacturing sector depleted by the 2008 recession also poses challenges.

"We need to use the advantages of Britain's often quoted innovation skills," said Ian Perry of Integral Lighting.



The result of Aether Lighting's work at Salford Media City is truly striking.

"This is a major area where we want to work with universities' design and development groups. We are very keen on partnering with universities as undergraduates and postgraduates have more creative skills than those of us coming from an engineering or production background. Our hope is that Brunel, be it undergraduates, postgraduates or academic staff, will think outside the box and look for new ideas related to illumination."

Brunel University London is an important player in this sector through its research activity and links with the Lighting Education Trust since 2012 to meet the need for a new generation of highly qualified lighting designers with technical and creative expertise.

Over the past two and half years 44 students have taken up year long placements in the lighting sector, 13 with London SMEs, 20 student collaborative projects have been completed and 28 students have graduated with specialist lighting design qualifications. Co-Innovate award winner Aether Lighting is a shining example of successful collaboration and skill building.

"Engineers are everyone's future," said Ian."The government says they want to increase our manufacturing base and have a resurgence of local production, but they do nothing about it. We are back to working directly with universities and colleges to rebuild our manufacturing base."

Brunel has recently secured funding from the €3 billion EU Horizon 2020 research fund and is leading a European consortia of companies to develop the capability to scale up production of OLEDs for lighting applications. OLED is widely predicted to be the next technology to make a significant impact in reducing the 18% of total electric power devoted to lighting in the UK. The future could be bright!.

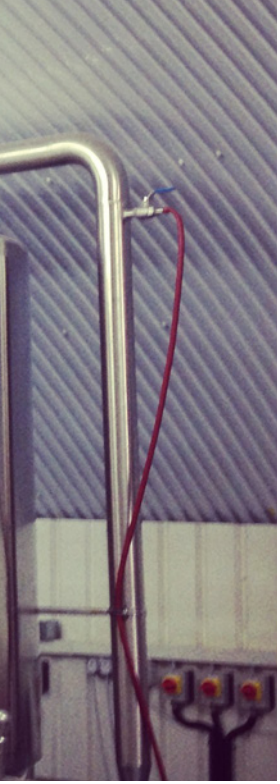
Food

In the food sector, the largest manufacturer in the UK, innovation has been slow. While the economy has improved, over 50% of all British SMEs fail within their first year of business.

Building a brand is a long-term process, something especially difficult for companies in the food sector where identity can be affected by new diet trends or food safety regulations.

"One of the hardest barriers to overcome was finding a factory to help me produce," said Alia Arain, founder of Aara's Baby Food. "After a lot of doors were closed on me. The thought of halal and organic baby food was frightening to so many people. I took the plunge and bought my own factory!"

Innovation in the food sector is typically incremental, with few new innovative products entering the market. While this type of innovation can encourage competition and growth over time, it may be responsible for the shortage of skills in Britain's food industry today.



Far left & left: The process and the result at The Five Points Brewing Company.

Supporting new food and drink ventures can meet the growing demand for new roles - 170,300 additional recruits needed by 2020, according to the Food and Drink Federation.

The Government has allocated nearly £1.7m to up-skill workers, but brand consultant Trevor Bradford believes that taking the plunge is the first step to success. "Launching a new product is always a challenge," said Trevor, who provides advice to businesses with his company BrandVoice. "If your brand isn't properly positioned you're going to have distance with the customer."

Knowing how to differentiate yourself in a flourishing market is important. Organic trends have boomed in the infant food category with approximately 50% of British households buying organic baby food, according to a 2014 report by The Soil Association. Distinguishing a brand is true for anyone in the sector.

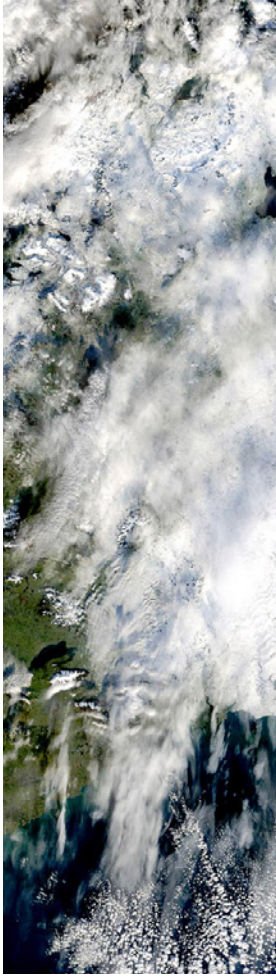
Doreen Joy Barber of London microbrewery The Five Points Brewing Company can relate: "It's important that brewers keep innovating in many ways, while still keeping in touch with what is a very old profession," said added: "For us, we need to be able to stand out through quality, consistency, customer service and branding."

The Co-Innovate network gave Alia the confidence to get her company off the ground.

"The Co-Innovate network introduced me to both mentors and other entrepreneurs whose experiences were a fantastic learning curve for me."

Sustainable Energy

Mike Chan, sales director of Buy Energy Online, discusses the 'trilemma' of energy challenges that the UK currently faces: affordability, security of supply and the low carbon agenda.



With alternative energy sources projected to account for 20% of British power by 2020, the energy sector is expanding and placing a priority on innovation.

Buy Energy Online is a London-based Energy Market Consultancy that provides information on energy costs and industry movements through new transparent software and peer-to-peer trading. The company is committed to collaborative innovation, having launched the Energy Innovation Hub in October 2014. Hosted by Co-Innovate, the event was attended by over a 100 executives from the energy sector, including UK Energy Secretary Amber Rudd, Mary McLeod, MP for Brentford and Isleworth and Small Business Ambassador for London.

"In the last 20 years more people are jumping on the bandwagon and there's lots of new of new technology on the market," said Mike. "It's about getting different energy professionals together to resolve contemporary issues - it can be compliance, new legislation, new technologies, how to invest, how to find money and how to share ideas, because it's a constant challenge for businesses."

The evolving market has created opportunities for new start-ups, such as SolarBotanic Ltd - a company providing an integrated renewable energy solution. They recently partnered with Dr Richard Bonser and design student Elise Hounslow.

"My project was to build an artificial tree that would act like solar panels and wind turbines," said Harry Corrigan, SolarBotanics director. "The ability to do that was there, but the problem was the way it was originally designed did not make it economically or commercially feasible to build. So I approached Co-Innovate."

The result was both "diligent and creative" according to Harry. The academic and creative input from Brunel University London having provided a platform to further develop and launch the project.

The energy workforce - now supporting approximately 680,000 jobs nationally - will need to increase by more than 200,000 people by 2020, according to research carried out by EU Skills, if renewable targets are to be met. With a focus on

"We can't fight, buy or talk our way out of the carbon challenges we face...we have to think our way out"

Mike Chan, Director, Buy Energy Online

SMEs, the Government's Energy Entrepreneurs Fund is £35 million of funding potential for new energy efficient technologies. The response to the 'trilemma' and opportunities for innovation are not restricted to energy supply.

Brunel professor Savvas Tassou is a researcher at the Institute of Energy Futures. He outlined the four major research themes he leads which potentially impact on all aspects of our lives from the fuel and motors in our transport, to how we manage resources in our homes, to how our cities are lit. Successful innovation in the sector emerges from multidisciplinary approaches.

"None of us are new to business. No one can claim to be expert in all fields," said Mike. "But together we can try to come up with something that's ahead of the game and creative."

Health & Wellbeing

Our health and wellbeing perhaps encompass the most significant challenges for research and innovation to tackle.

In the UK, the NHS is regularly a focus of attention and faces economic challenges resulting from an ageing population, sedentary lifestyles and complex and expensive healthcare provisions. According to the Office of Health Economics, the cost of the NHS has risen from under £20bn pa in 1950 to over £140bn in 2010, consuming 9% of national income today.

These challenges are also opportunities. Innovate UK and the European Union through its highlight the potential role of SMEs through their €70.2 billion Horizon 2020 research fund.

Octavio Pernas, the national contact point for the health related funding, points out that, "the UK has significant foundations on which to build and to get more SMEs involved in health projects."

The UK excels in research- its small population accounting for 11.6% of citations and 15.9% of the world's most highly-cited articles, according to a 2013 BIS report. But despite the UK's superiority in research and vast amount of funds available, many SMEs are still unclear on how to access support for innovation.

An exhibition of Product Design students work carried out in collaboration with Guy's' & St Thomas' Hospitals in 2014.

Drinksafe provides a low cost disposable test for arsenic contamination of drinking water. But for the scientists behind the technology, commercial design and marketability were not their specialties.

"Co-Innovate provided us with design management expertise to help secure £950,000 development funding to complete field-trial work."

Research and development in the health sector is often characterised with the top universities and global pharmaceutical companies. Co-Innovate bridges this gap. For example BioNano Consulting, a spin out from Imperial College and UCL, created Drinksafe - a low-cost disposable test for arsenic contamination.

A 2000 World Health Organisation report described the arsenic contamination of water from millions of bore wells in Bangladesh as 'the largest mass poisoning of a population in history...beyond the accidents at Bhopal and Chernobyl'. Globally, 130 million people drink water contaminated with arsenic at toxic levels, many of whom also live in poverty.

Design, with its emphasis on a holistic understanding of people, can work in a powerful combination with technology and business elements and can bring new thinking and solutions. Co-Innovate's work with Blue Badge Style to bring style to people with wheelchairs, or Smarter Key's electronic systems for care worker access to homes show some of the potential breadth of opportunities.

In addition to human centred design expertise, Brunel University London has a formidable range of research expertise in health related fields including experts and facilities in neuroimaging and cognition, rehabilitation, bio-engineering, health economics and ageing studies.

04

INNOVATION EXPERTISE

NESTA, the UK's leading organisation for promoting innovation, suggest that since the 2008 recession the UK economic debate has polarised around Plan A, Austerity, or Plan B Stimulus. They point out that neither considers the long-term and, as a result there has been a 'lost decade' of innovation. They call for a Plan I for Innovation.

Co-Innovating

Expertise for Innovation

Since the beginning of Co-Innovate we have delivered a series of events and professional development workshops positioned at the 'front end of innovation'. The ideas, motivation, skills, vision and synapses of connections exchanged here, can be the start of innovation 'journeys' that lead to new products, services, highly skilled workforces and growing companies that will benefit us all.

Taking the strategic view that innovation demands is difficult for many resource limited SMEs. The Co-Innovate events and professional development workshops create a small but important window of opportunity to build innovation capabilities and potential within the company.

RIght: Attendees at a Co-Innovate event on the future potential of crowdfunding for Britain's SMEs

"Services for older people have to shift from a paternalistic 'doing-to' model to the 'involvement-led' approach that older people value."

Professor Peter Beresford OBE, Director of the Centre for Citizen Participation at Brunel University London

Arthritis

The ageing population has become a well known phenomenon that will impact our future, not least in that we will all need to work for longer before retirement. Co-Innovate sees this evolving demographic as an important driver for innovation. New products and services addressing peoples' needs will not only improve lives, but can also have a significant economic impact.

Our Independent Living event held at the London Chamber of Commerce's HQ in the City in 2013 included a keynote presentation from Dr Inman Haq, Associate Medical Director for Arthritis Research UK. Dr Haq highlighted that design and innovation can contribute to the treatment of arthritis and aid independent living in many ways. These include helping to develop assistive and therapeutic interventions; supporting behaviour change and contributing to new research and innovation methods to better target the needs and opportunities.

Developing solutions to these challenges requires multi-disciplinary and collaborative approaches. Events like the one in the City showcase the spread of research expertise and activity within Brunel University London providing companies with practical opportunities to learn about the latest research and engage with collaborative opportunities.

Other 'Independent Living' speakers included representatives from Brunel's specialist research groups: Brunel Institute for Ageing Studies, the Health Economics Research Group, the Human Centred Design Institute, biomedical engineering and healthcare technologies within the Brunel Institute for Bioengineering and Brunel's Centre for Sport, Health and Wellbeing.

Brand, marketing and the digital realm

Marketing, branding and digital operations are universal foundations for today's business. In a recent survey by Brunel University London and technology service business Applegate, 98% of UK companies were found to have websites, but only 41% of companies had adapted their websites for smartphones and tablets.

Co-Innovate has been working with London SMEs to help meet the fast moving challenges of the 21st century. We have teamed up with brand experts BrandVoice to lead a series of workshops introducing new knowledge and understanding. Participating companies get taken through the practical steps on how the digital realm can become an integrated part of operations, how to audit and develop brands and how to exploit social media and go mobile.

Bill Wallsgrove and Trevor Bradford, who lead the workshops, have over 50 years industry experience between them and are successful entrepreneurs in their own right, having launched the innovative Colour&Paint online paint company.

Brunel has multiple courses devoted to the areas of design, branding, digital design, marketing and related management. This provides a considerable resource of placement students, project opportunities and staff with research expertise. Associate Professor John Boult and Chris Holt, ex Head of Design at British Airways, have worked with Co-Innovate and led workshops including tailored design and brand audit sessions as part of our ongoing programme of professional development workshops.

Cycling

Brompton Bicycle's Will Butler-Adams struck a chord at Co-Innovate's 'Cycling to Success' event, describing the DNA that has made his company a global brand in 42 countries and largest cycle manufacturer in the UK.

But the young MD cautioned against the idea of radical innovation, arriving at the 2013 event on a 20 year-old version of the Brompton bike. This bike's brake lever has been prototyped 17 times to its latest re-design, demonstrating that steady evolution is often the most successful route for product development.

Design and innovation are inherent in cycling. The cycling economy in the UK has grown considerably in the past few years making a £2.9bn contribution and a 28% increase in cycle sales in 2010, worth £1.62bn. Health benefits are estimated to save the economy £128m a year in reduced absenteeism, according to 2010 research by the London School of Economics research.

Hosted at the Old Vinyl Factory, 'Cycling to Success' also included

Far left: Rob Bye, Product Design graduate doing research in Gambia.

Left: The Brompton Bicycle factory in West London.

‘Our turnover and production have been growing by about 30% each year for the past three years, but we’re not in a rush to grow and sell out, most of all we do this because it’s fun’

Will Butler-Adams, MD Brompton Bicycle

presentations from a diverse group of Brunel researchers covering topics from sports science, materials science, mechanical engineering, smart textiles, urban design and inclusive design.

Every year, as many as five of our students complete final year projects devoted to innovation opportunities in cycling. Rob Bye’s Africa Bike, sponsored by the James Dyson Foundation and Dave Granshaw Foundation, was designed for markets where cycle transport has a significant effect on livelihoods.

Manufacturing Advisory Service

Thomasina Miers, founder of the Wahacha restaurant chain, is a Masterchef winner and food writer for the Times, Guardian, and the Sun. She provided the inspirational keynote address to an audience of London food manufacturing businesses at the British Library in 2014. Co-Innovate partnered with the Manufacturing Advisory Service (MAS) to present an event titled 'Food for thought: Turning food waste into business opportunities'.

Food is perhaps not the first thing which comes to mind when one thinks of Brunel University London. However the University has considerable interests and expertise in the sector, strongly represented

in West London by companies such as Heinz, Noon Foods, Nestlé and Charlie Bigham's. Co-Innovate hosted the launch of the major five year Open Food research initiative at the Old Vinyl Factory in Hayes. Other major research programmes include leading the Centre for Sustainable Energy Use in Food Chains initiative with 36 leading organisations.

Typically these ongoing research programmes are actively seeking companies to work with and case studies of applications.

Co-Innovate helps to link this expertise with the practical needs of SMEs by running professional development events in topics such as packaging design, green marketing, trends and marketing in digital environments. We have provided workshops for the Waitrose Supplier group of companies and continue to build a network of individuals and businesses committed to the potential of collaborative innovation.

Thomasina Miers speaking at the Food Waste event at the British Library in September 2014.

'We want this event to change the way food and drink companies think about waste and how it can be turned from an expense into a way of generating new revenues'

Melissa Addey, specialist food advisor at MAS

Crowdfunding

...the future of small business funding?

The concept of using an online platform to raise finances for a product or service has grown 9,000% since 2004 and is estimated to have created 270,000 new jobs in the US in 2014 alone. In a report by crowndfunding.org, the global value of crowdfunding will reach $34.4bn in 2015, but funding success is never guaranteed.

The collaborative spirit of Co-Innovate is completely in tune with crowdfunding's potential. We have now completed five events focused on upskilling SMEs and entrepreneurs in line with the benefits of crowdfunding's Internet focused business model.

These events boast audiences of over 250 people wanting to learn about the differences between platforms, how to leverage social media, create video propositions, define reward schemes and

Jewellery designer Lenique Louis at a Co-Innovate crowndfunding event in early 2015.

"The collaborative spirit of Co-Innovate is completely in tune with crowdfunding's potential."

Stephen Green. Co-Innovate Project Leader

plan manufacture, logistics and sales. Professional development workshops are led by people who have a proven track record in the field such as Julian Swan at the Imagination Factory and Oscar Lhermitte of Sidekick Creatives and an impressive range of expertise such as the British Library Open Innovation unit, the Intellectual Property Office and the Royal Society of Arts.

05

GLOBAL RESEARCH

Brunel University London has a proud tradition and distinguished reputation for business and industry collaborations stretching back 50 years to its formation in 1966. The University has recently risen to 25th place in the Times Higher Education (THE) worldwide ranking of the top 100 universities under 50 years old.

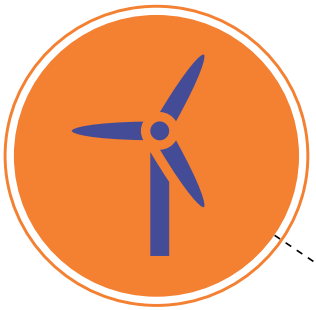
Co-Innovating with

Global Research Expertise

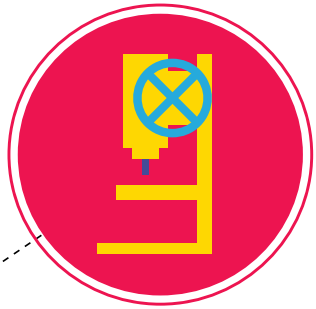
Teresa Waller
Director, Research Support and Development

Brunel University London is internationally renowned for cutting edge global research. An emphasis on collaborative industry-based and applied research provides a focus on creating socio-economic impact and commercial benefits. Each Research Institute illustrated opposite has a dedicated Business Development Manager helping companies access research expertise and equipment and facilitating the development of joint applications to funding bodies for funding of collaborative R&D projects. The University is adept at leveraging Government, Research Council and European co-funding for collaborative projects. Brunel also holds the third largest portfolio of Innovate UK funding of any University in London and has a strong track record of attracting European funding for collaborative projects with SMEs.

Opposite: The three Research Institutes that offer multi-disciplinary capabilities in a wide range of areas



Energy Futures
Advanced Engines and Biofuels
Sustainable Technologies
Smart Power Networks
Resource Efficient Future Cities



Materials and Manufacturing
Structural Integrity
Liquid Metal Engineering
Micro-Nano Manufacturing
Materials Characterisation
Sustainable Manufacturing

Environment, Health and Societies
Health and Environment
Healthy Ageing
Synthetic Biology
Biomedical Engineering & Healthcare
Health Economics
Social Sciences and Health

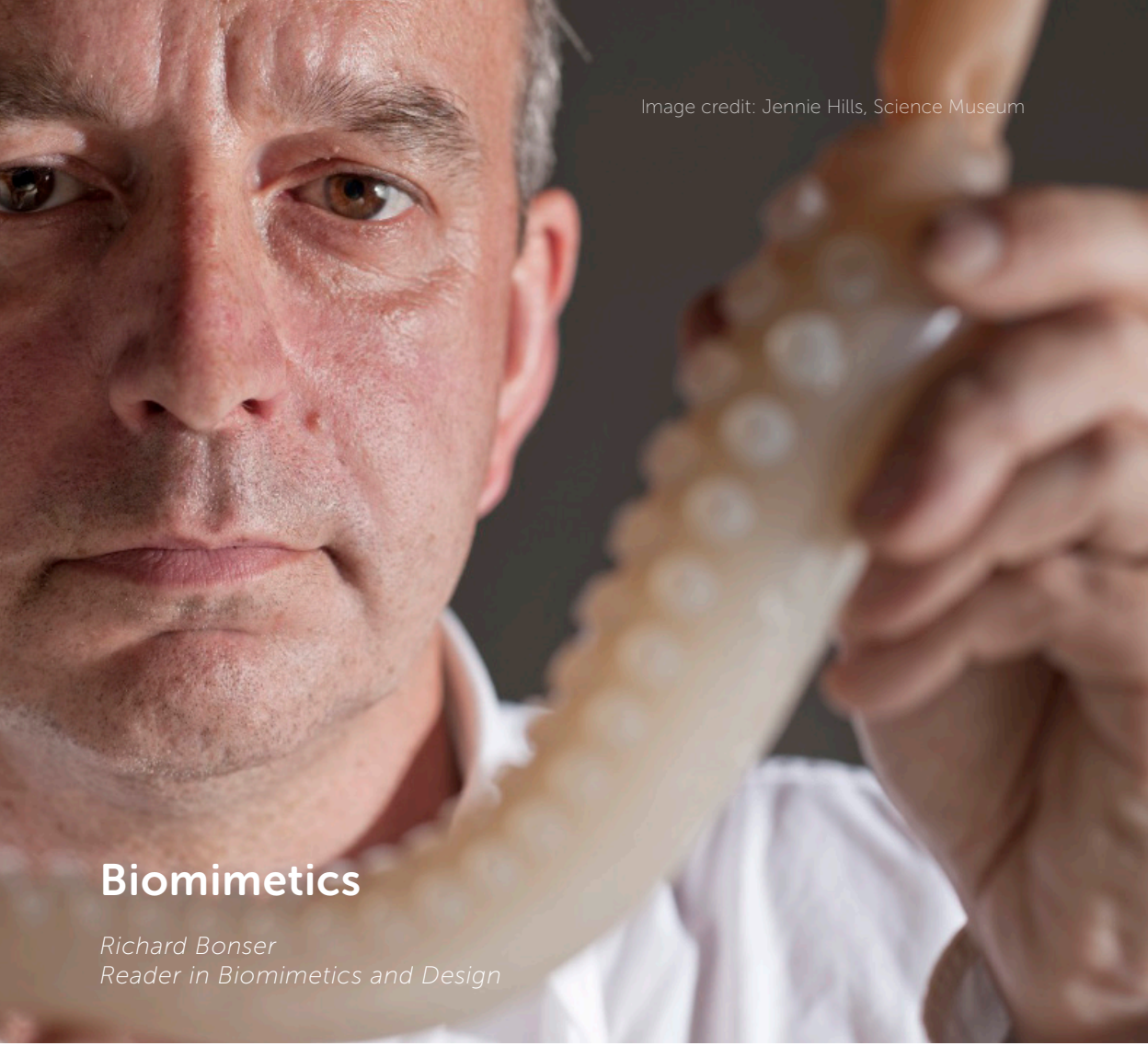


Image credit: Jennie Hills, Science Museum

Biomimetics

Richard Bonser
Reader in Biomimetics and Design

Biomimetics is a pioneering technology used by some of the world's leading researchers and top universities. By understanding the biology of plants and animals it has been possible to implement these characteristics, or processes, into technologies which have led to developments in areas as diverse as nanotechnology, medical devices and sports technology.

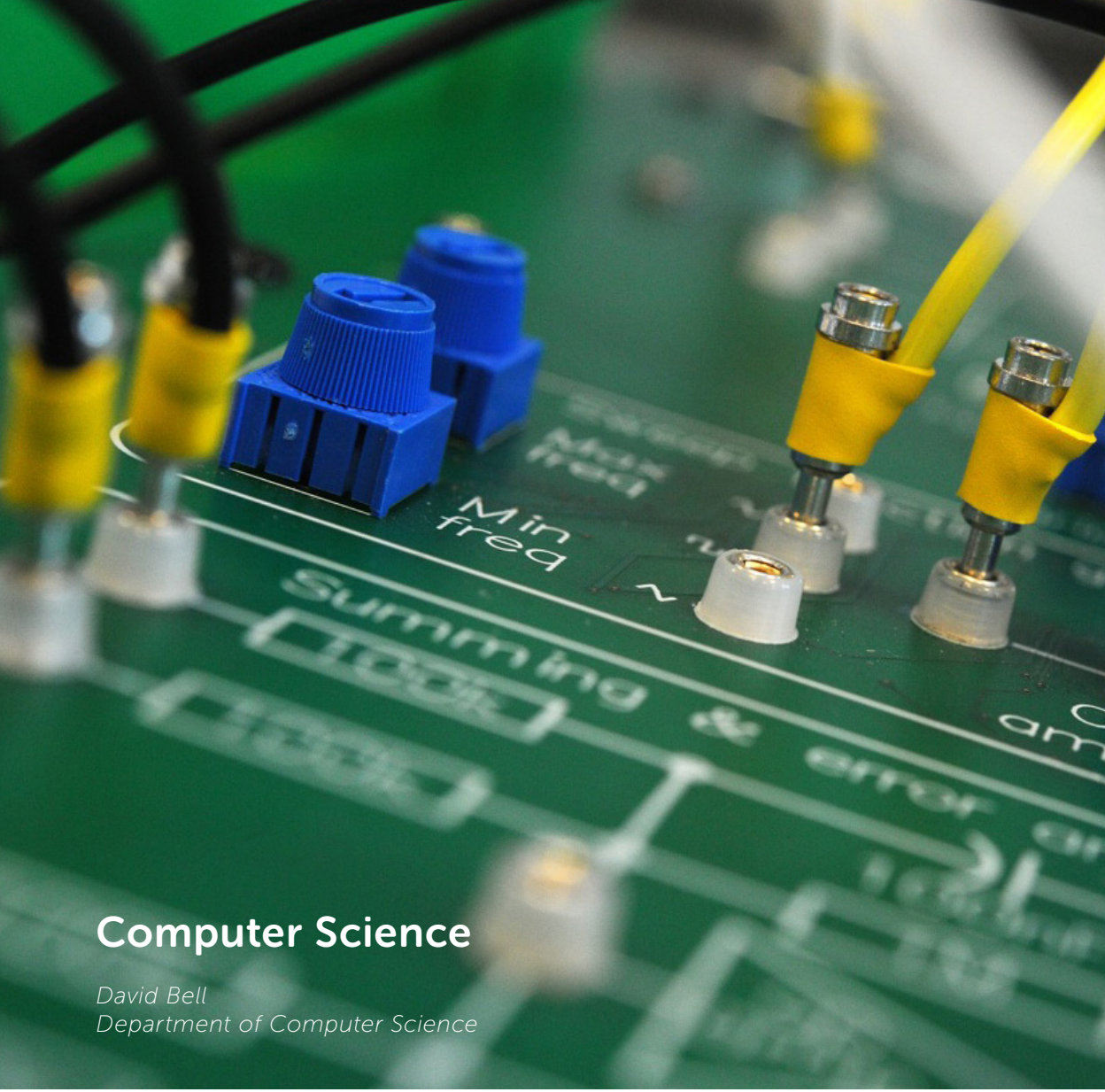
The work conducted here is in close proximity to commercial markets as biomimetics aims to solve real world problems by enhancing design and innovation through understanding how

nature solves problems - the tree's ability to withstand wind, utilised in the design of a skyscraper, is an example.

Often academics will provide companies with expertise within a particular field they are looking to explore. Whether an SME or corporate multinational, it is easier for the business to outsource R&D in a complicated field like biomimetics rather than becoming experts themselves. But often SMEs are too busy with day-to-day business and do not have the time or resources to take a wider perspective and try partnering with universities.

Recently, through Co-Innovate, we have provided advice to innovative architectural practice Astudio. Currently looking to set up their own research department, the Co-Innovate award-winner, wanted to increase the company's commitment to sustainable design through the use of biomass and other chemicals.

The potential for a building to generate power through algae panels is a smart and aesthetically pleasing solution to renewable power. It is currently an under-researched opportunity. Therefore collaborations like these are equally beneficial for academics, companies and the students involved. It is a win-win for everyone.



Computer Science

David Bell
Department of Computer Science

Brunel's Department of Computer Science (CS) is an interdisciplinary centre that includes researchers with a range of backgrounds. CS members work on a range of related topics including software engineering, intelligent data analysis, human computer interaction, information systems, and systems biology. We have just over 40 academics and since 2008 they have produced over

500 academic journal papers in top publications, demonstrating our world leading research. We have been were awarded over £13m in external funding, including over £8m from the UK research councils.

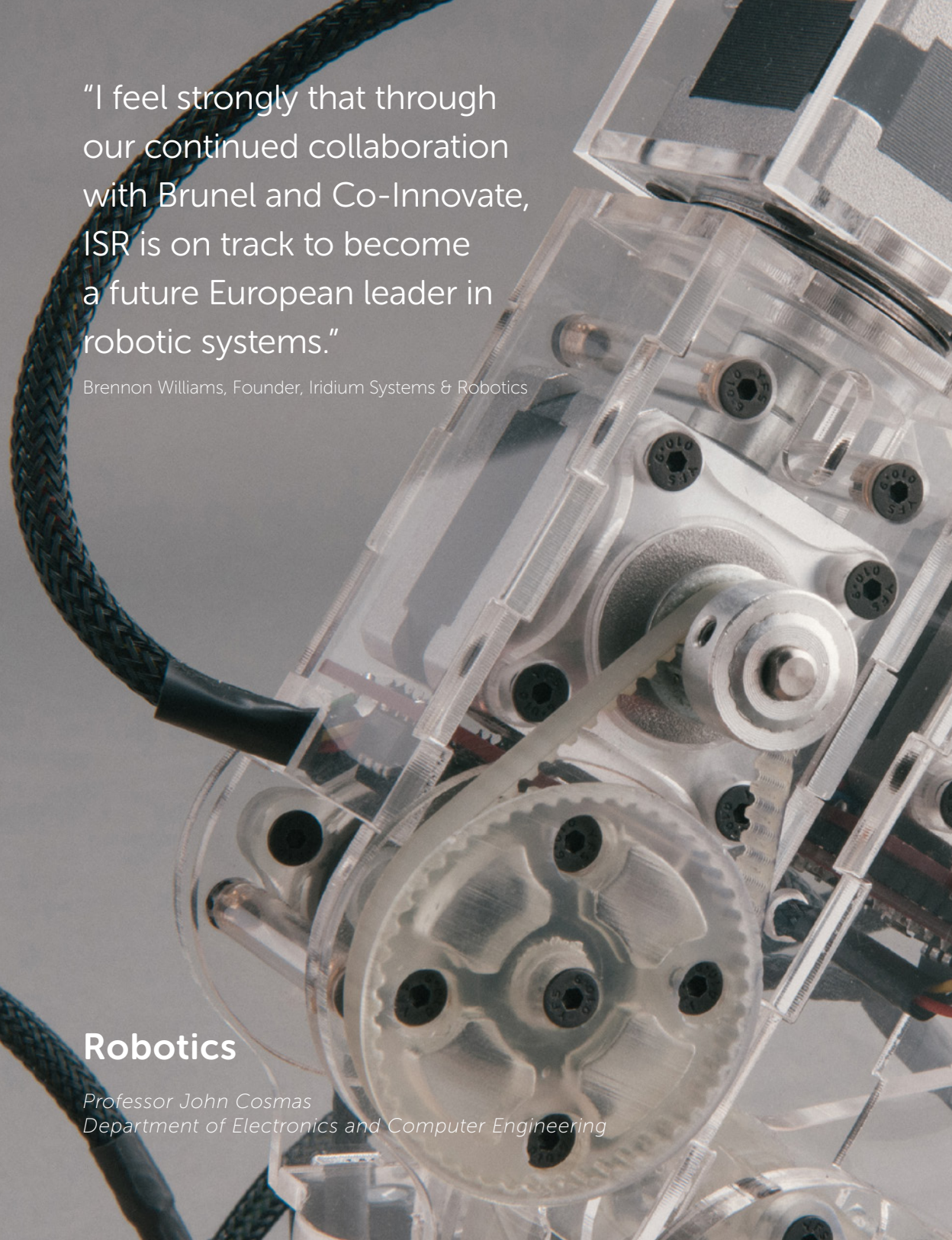
In such a fast moving discipline, working directly with companies to apply our developments in computer science is also integral to our approach. We are working with a number of Co-Innovate companies, providing research and technical development to further develop concepts, business plans or products.

A number of projects have had a big data element where our approaches to intelligent data analysis, semantic modelling and cloud data storage can be practically applied to address specific company objectives. Collaborative activities have been particularly effective when problem and solution knowledge is shared over the course of the projects.

Since 2008 over 100 research students have graduated from the CS department. Our researchers have a high visibility and include editors of major journals, a past president of the UK Academy for Information Systems (UKAIS), and ten members of the EPSRC College. In addition, they have given keynotes or organised many major international conferences.

Furthering our research excellence, CS is the host institution for the Multidisciplinary Assessment of Technology Centres for Healthcare (MATCH), one of only 18 EPSRC Innovative Manufacturing Research Centres.

The diversity of our work and publications include: Biomedical Informatics (Nature Cell Biology; IEEE Transactions on Biomedical Engineering; PLoS Computational Biology;Science), Information Systems (European Journal of Information Systems; the Journal of Information Technology), Software Engineering (IEEE Transactions on Software Engineering; ACM Transactions on Software Engineering and Methodology), Artificial Intelligence (IEEE Transactions on Neural Networks and IEEE Transactions on Evolutionary Computation), and Theoretical Computer Science (SIAM Journal on Computing; Theoretical Computer Science).



"I feel strongly that through our continued collaboration with Brunel and Co-Innovate, ISR is on track to become a future European leader in robotic systems."

Brennon Williams, Founder, Iridium Systems & Robotics

Robotics

Professor John Cosmas
Department of Electronics and Computer Engineering

Brunel University London can help your company's product development strategy through collaborative strategic thinking. We do this by jointly developing a coherent research programme with you and our internationally acclaimed team of researchers in complementary disciplines across the UK, EU and the world.

The UK and EU promote innovative industrial products through publicly funded research projects in a wide range of areas, including: Information Communication Technologies, Space, Transport, Health, Energy, Climate, Nanotechnologies, Biotechnology and Manufacturing and Processing Advanced Materials.

Our work in the Wireless Network Communications research group was an excellent fit with the requirements of Iridium Systems & Robotics (ISR) who were introduced to us by Co-Innovate. We helped bring together a pan-European consortium and make a €7 million EU Horizon 2020 bid for developing robotic systems for public environments.

Horizon 2020 is an EU research and development funding programme specifically targeted at supporting SMEs through to commercialisation of new products and services and will invest €3 billion between 2014-2020. The work with ISR is an example of how our research expertise can help identify the current state of the art and the limitations of current products as well as the sort of innovative improvements which can attract major funding.

Brennon Williams, founder of ISR stresses the strategic value of this type of collaboration: "The work completed to date has been invaluable for establishing a highly credible international consortia of both commercial and academic partners. The incredible level of support has also enabled ISR to greatly improve planning across a wide range of areas in our business including product/marketing development and commercial strategies."

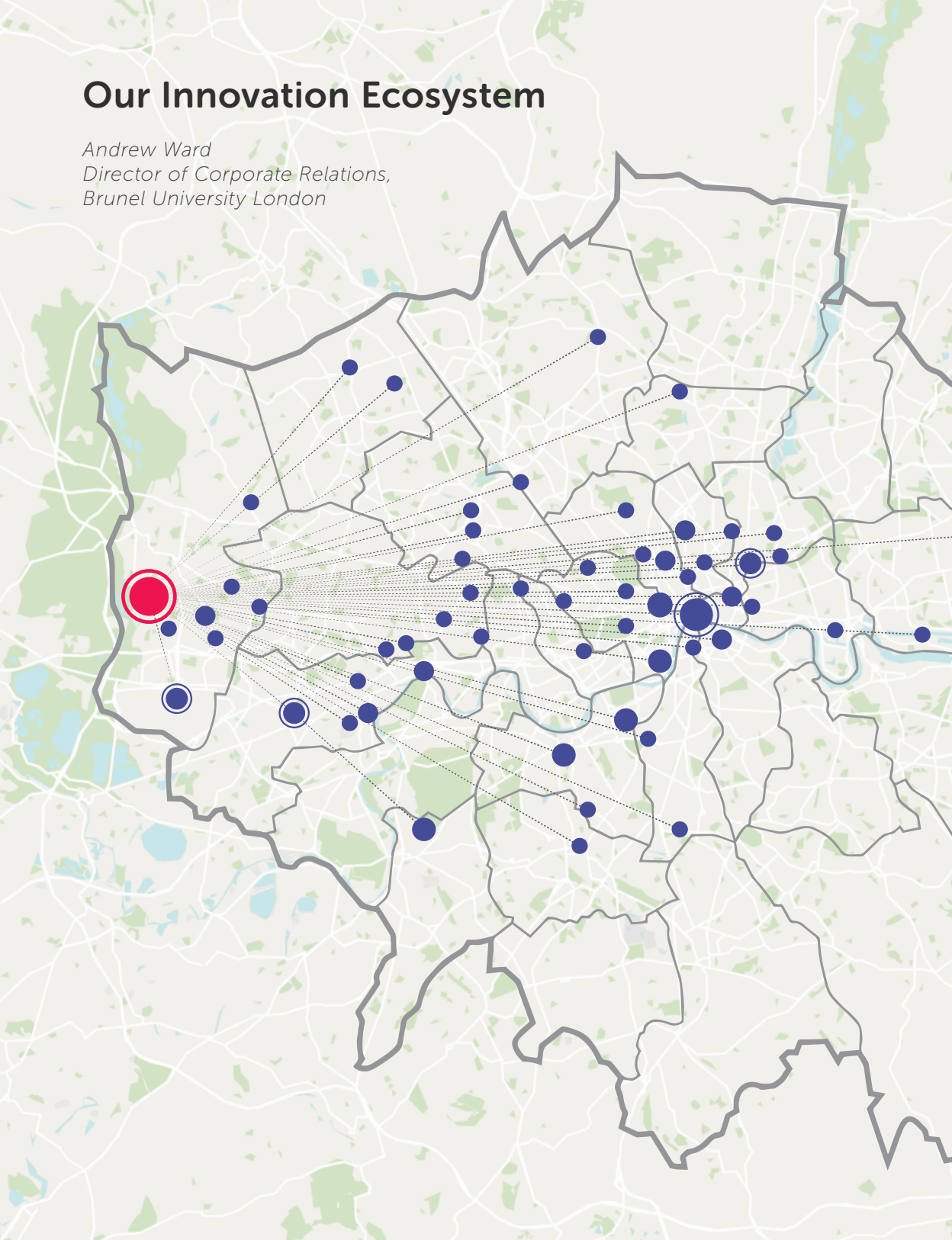
06

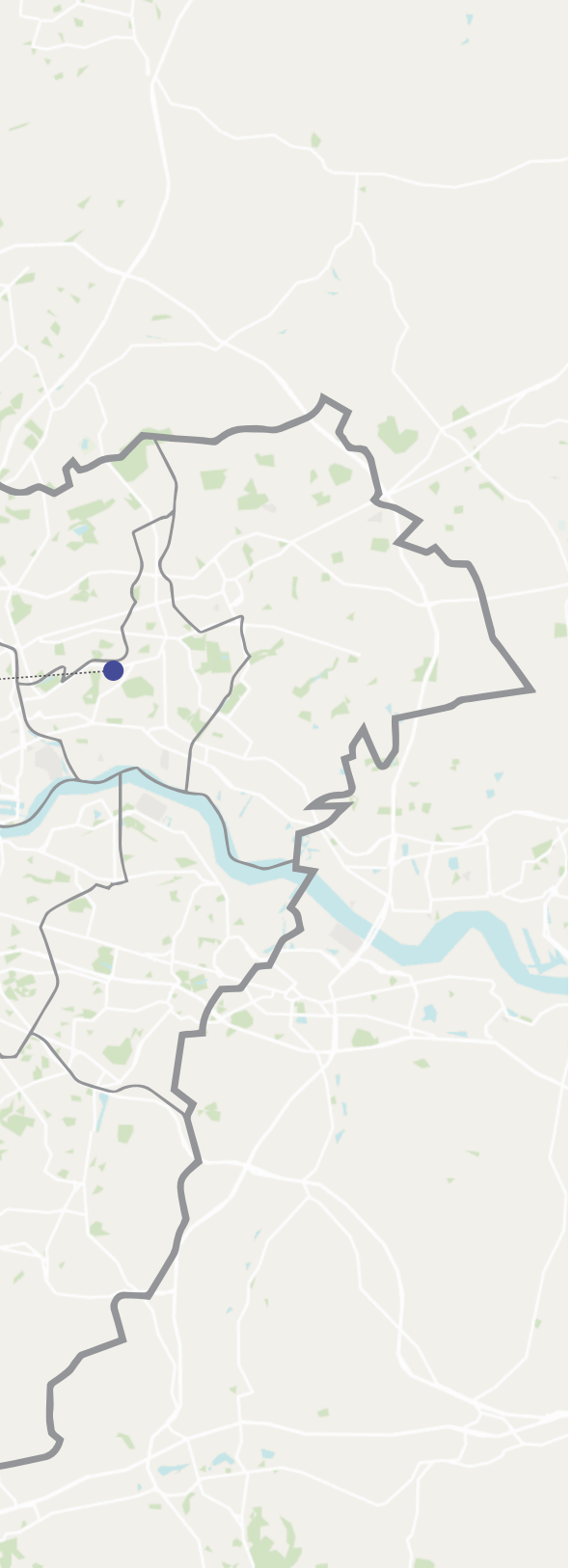
WHAT'S NEXT

Co-Innovate was set up as a a two year project – but it also marked the beginning of our determination to further develop the ways of working that characterised this project's aim. With an outstanding new innovation centre – the Central Research Laboratory – opening soon, and more companies, staff and students Co-Innovating all the time, we are on track to realise a genuine innovative ecosystem.

Our Innovation Ecosystem

Andrew Ward
Director of Corporate Relations,
Brunel University London





The ecosystem we are developing - and which Co-Innovate has played such an important part in making real - promises not only to impact positively on the business practice of our partners but also to enhance the learning of our students and the research of our staff.

This ecosystem will be fully in place when working with staff and students at Brunel University London is not a strange or infrequent activity for our SME partners but a requisite of their business operations; when for staff and students collaborating with companies is a recurrent and distinctive feature of what they do; and when we have available the full range of facilities and support structures in West London to accommodate the new businesses that Brunel and other universities will spawn.

Another key element in the ecosystem is the University's role in bringing businesses together for events and workshops to hear of new techniques and thinking but - just as importantly - to meet other businesses and for University staff and students to learn from these businesses. And this is what is so exciting about what we are trying to do: those businesses who we co-innovate with can also become mentors to our graduate entrepreneurs and research partners to our staff. In this sense, we are developing our own circular economy.

We are not there yet: our ecosystem is still forming, but the key elements are in place and we have the active support of a range of partners - from West London Business, the Local Authority and the GLA. The momentum is undoubtedly growing.

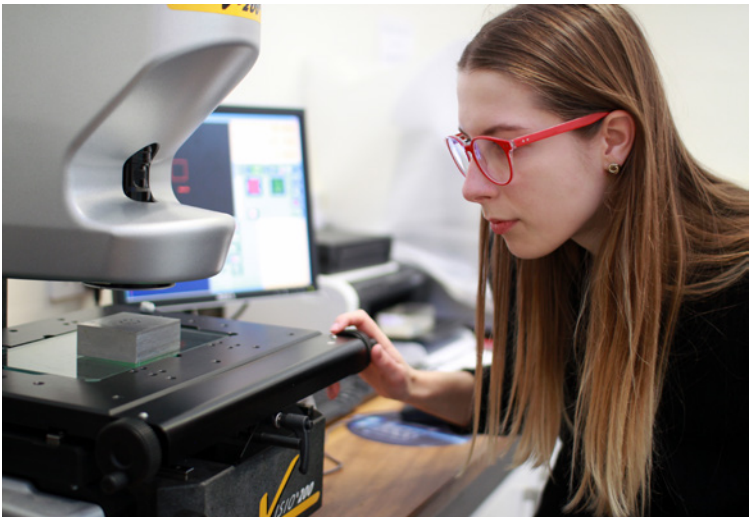
Central Research Laboratory

The CRL is an exciting collaboration that will enable creatives, inventors and innovators to develop their ideas into a commercially viable reality.

The University's Making the Future programme - in partnership with the Cathedral Group, the Mayor of London and the Higher Education Funding Council for England - is an unrivalled support package for young designers. At the Central Research Laboratory in Haynes, 182 'makers' will develop their businesses and gain access to a Fabrication and Prototype Production facility. In making this available, we are fulfilling our commitment to ensure that more of our very talented inventors become successful innovators and play their part in realising our innovation ecosystem.

This custom-designed innovation centre will be open to businesses from across West London and beyond. Places will be offered to creatives with bright ideas and the determination to realise them. The following stories are shining examples.

Bump Mark
The Bump Mark is a clever bio-reactive food label developed by Solveiga Pakštaitė for her final-year project as industrial design student at Brunel University London, which was designed to help everyone gain more accurate expiry information for fresh produce, especially visually impaired users. The label, made from gelatine, degrades at the same rate as the food to which it's attached, leaving the initially-smooth label bumpy when the food has expired.



Winner of the James Dyson Award in 2014, Solveiga has caught supermarkets' attention with her innovative new food expiry label: Bump Mark.

Since she first began developing the label, Solveiga has received various awards for her invention, as well as much attention in the national press. She was awarded the Inclusive Design Award at the Made in Brunel show in 2014 - a prize awarded by Brunel lecturers for a project in the field of sustainable design. Shortly afterwards, Solveiga was awarded the national James Dyson Award in September 2014, and was subsequently featured in the Top 1,000 Londoners list, compiled by the Evening Standard.

In March the following year Solveiga won the Mayor's Low Carbon Entrepreneur prize, which asks London's students and recent graduates to come up with ideas to reduce the capital's energy use and carbon emissions. Demonstrating the potential for her label to help minimise food waste from unnecessarily discarded produce Solveiga was awarded £20,000.

Most recently Solveiga featured in a 'Food' episode of the BBC programme Rip Off Britain, interviewing Asda shoppers about their views on current fresh food labels, and the benefits of her invention, which garnered an enthusiastic response.

Bubblegum Stuff

Courtney Wood is one of Brunel's brightest young entrepreneurs, providing a path for

"At Brunel, you don't just learn to be a designer, you learn about the whole process, from product pitches to working with manufacturers to marketing. It makes you feel a lot more ready to try and go it alone."

Courtney Wood, MD Bubblegum Stuff

talented individuals to follow. Graduating from Brunel in 2009 with a degree in Industrial Design and Technology, he quickly started work in the novelty gift industry, joining a small company and working his way up to lead designer. But after two and a half years he was certain that he did not want to just work for a company: He wanted to create one.

Courtney admits that the skills he learned in his degree were invaluable in helping him make the big leap to self-employment. Another thing that helped was his networking skills: "Over the years I built up a range of contacts around the world, so I knew I had distributors in Australia and Germany who would be willing to buy my products – that made it less of a daunting prospect."

Raising the funds to begin his company was still a challenge. Courtney came up with a novel solution: selling refurbished bicycles to Londoners in the run-up to the 2012 Olympic games, after reports that the Tube would be unable to cope.

Bubblegum Stuff is a novelty gift company setup in 2012 by Brunel graduate Courtney Wood.

Funds secured, Courtney moved to Hong Kong for six months to develop his first products. He has since expanded to work with suppliers in Canada and beyond, as well as selling his products directly in the UK; to companies like HMV, Hamleys, and many museums and galleries.

Courtney recently issued a challenge to a group of Brunel students - create a product for his company to sell. The entries were shortlisted and after showing them to industry partners, Emma Peacock's concept, Blood Spill Doormat, was selected as the winner. The first units will be produced for Christmas, and Emma is £500 richer; perhaps on her way to starting her own venture.

Mezzo

While most students prepare for exams by spending hours in the library, Charlie Smith spent the weeks before his first year finals guiding a team of sled dogs through the Arctic. Design backed by personal experience is a core tenet of this first year Industrial Design student, who is the youngest Britain to cross Iceland north to south unsupported. It was on this trip in 2013 that Charlie first came up with his idea for Mezzo, a unique portable stove/water purifier system, after seeing the inefficiency of having to carry five bottles of fuel in order to both cook food and boil water. Charlie developed Mezzo further during his A-levels, and won the Manufacturing Technologies Association (MTA) "Designer of the Year" award in 2014.

Though Charlie already had financial backing and the beginnings of a market-ready product, he still saw a university degree as key. Brunel was always his first choice, and when he came to visit he saw access to services like the Innovation Hub as exactly the support he needed to continue developing Mezzo. Charlie's Industrial Design course has helped him to continue making improvements to his product. Aspects of his coursework, outlining target consumer groups and expected development cycles, can be taken straight into meetings with suppliers and vendors, demonstrating the strong real-world focus that underpins Brunel's courses.

Mezzo is a true innovation, and when launched is sure to become a must-have in the inventory of any dedicated adventurer. It is able to boil a litre of water in a third of the time of conventional systems, weighs less than two pounds and has no limit to the amount of water it can purify. The product has met with universal acclaim: "Everyone who has seen one wants one" said Charlie.

Thanks to his MTA win, Charlie is in talks with Mazak to produce a range of prototypes, followed by an initial run of 5,000 units, some of which will be given to high profile adventurers in sponsorship deals, and the rest sold as a limited run.

Charlie is still very committed to the testing process however. In December 2015 he, another Brunel student and two colleagues will attempt to become the youngest team ever to cross the polar regions of Iceland carrying all of their own gear.

Inventor and explorer Charlie Smith photographed on his Arctic expedition (left) and his innovative portable stove/water purifier concept (below).

Research Funding Opportunities

Alicen Nicksen
Deputy Director, Research Support and Development

We can assist SMEs collaborating on research projects with Brunel University to access a range of funding sources. Innovate UK provides Government funding to accelerate sustainable economic growth and UK companies can apply for funding for:

- feasibility studies to test an idea and make sure it will work
- creating a new product or service, or improving an existing one, through research and development (R&D)
- working with other businesses or research organisations on collaborative projects.

The funding and support available via Innovate UK includes: Innovation Vouchers that help companies work with external experts (such as Universities) for the first time to deliver business growth; Smart awards that fund R&D to deliver new products, process and services; Collaborative R&D projects that support companies and Universities working in partnership on innovative projects in strategically important areas of science, engineering and technology.

The Eastern Gateway at Brunel University London.

Companies can also apply to the Knowledge Transfer Partnership (KTP) scheme to improve their business by working with an expert at a UK University. This expert helps the company to recruit a graduate to work in their business on a specific project lasting up to three years.

The European Union also offers a range of funding schemes accessible to SMEs, focusing on support for close-to-market activities that will boost breakthrough innovation. Our work with Iridium Systems & Robotics (ISR) described earlier in this section is an example of collaboration including a European funding proposal. Such schemes support clearly business-driven projects that demonstrate realistic potential for quick deployment and market take-up of innovations.

These European schemes may focus on specific strategic priority areas or industrial sectors, or may be 'non-themed' always open, providing a range of options and opportunities for SMEs.

Co-Innovate company index

An index of all the inspiring and interesting London-based SMEs who have been a part of the Co-Innovate journey so far.

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Co-Innovate contacts

SMEs typically find it difficult find the right expertise to support them within large universities such as Brunel. Co-Innovate provides a simple one stop starting point. Our success relies on helping match-make the right connections within the thousands of staff and students working at Brunel. Our team is on hand to connect you with the department, research group, staff or student who can help expand your business' potential.

Co-Innovate team

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Project Director, Director of Corporate Relations

Stephen Green
Project Leader, Department of Design

Paul Davies
Operations Manager, Co-Innovate

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Innovation Director, Co-Innovate

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Book designed and compiled by
morrama, a London based design consultancy

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ISBN: 978-1-908549-21-1