



TAY5G

Let's Connect



The
Scotland
5G Centre

Hidden Floors

The Power of 5G for
the Fashion Industry



SR:D

5G Fashion and Retail

5G has the power to completely transform the fashion and retail industry, from the process of designing and manufacturing to the staging of runway shows and purchasing of the latest trends, both instore and via online shopping.

We are already seeing the digitisation of the fashion industry begin as new opportunities arise for companies and consumers to turn to digital solutions. But this is only the beginning, with innovative, practical technologies emerging to ensure that both customers and designers are given a safe, easy way to showcase collections and enjoy a seamless online shopping experience when looking for the latest pieces.

Design Collaboration

5G offers ultra-fast download speeds and low latency communications, allowing designers to collaborate online and interact digitally in real-time. Imagine a group of designers or clients in different locations across the world all working on the same piece of clothing using AR technology. Changes could be made simultaneously and instantaneously to this piece with zero delays and no need for travel.

Design Production

The increased bandwidth of 5G allows for visually rich and detailed real-time content to be displayed over AR, VR and 3D modelling. AR and VR applications can also be applied to the design process, allowing designers to conceptualise creations digitally in AR and view life-like fabrics in more detail. There is a sustainable aspect to this as fabric is not needed to design in AR and VR, with designers simply using the fabric sample within the tech program resulting in reduced fabric waste, as garments could be designed without a single piece of fabric having to be cut.

Fashion Shows

5G technology can create a more immersive fashion show viewing experiences, through AR, VR and innovative holographic content, where the clothes, models and showcasing of garments is all constructed digitally. Through the use of mixed reality, fashion show's audiences can view additional digital elements through their mobile device, allowing them to get closer to the garment and fabric. Life-like 3D or holographic models can also be created through a 5G-enabled device, showing the flow and detail of fabrics and cut of garment in intricate details as if it's right in front of you. No longer will you need to be in the front row to see such details or even in the room. Those who opt for 5G are able to sit in the middle of the action as models walk down the runway wearing the latest fashion.

Retail

5G-powered technology will enable new immersive experiences as stores incorporate digital features. With use of AR, consumers can now try on garments, accessories and even cosmetics before they buy, creating a more bespoke and personalised service. There is so much potential with 5G from no cashier shops, using mobile phones to navigate aisles to providing a more connected efficient stock management, making returns and deliveries quicker.



Reduced Fabric Waste



Efficient Stock Management



Immersive Design Collab



Inclusive Fashion Shows

Tay5G Project & Challenge Fund

Tay5G is a project born from the Tay Cities Deal and is funded by the Scottish and UK Governments. Tay5G aims to encourage and support engagement with 5G across sectors which reflect the regional strengths and priorities of the Tay Cities Region.

Tay5G are working with partners including The Scotland 5G Centre, Scottish Futures Trust, Councils, Universities and other stakeholders in the Tay Cities Region. Tay5G's goal is to create opportunities to trial 5G mobile communications with use cases for all kinds of sectors from entertainment to manufacturing, healthcare to construction, and fashion to automated transport. 5G is especially great for enabling advanced communications like virtual reality, automation and the Internet of Things which is a key tool for Smart Cities. By encouraging and supporting engagement with 5G, it's easier to understand what it offers which helps to generate demand. In turn, telecom companies respond to that demand with faster roll-outs.

Tay5G Challenge Fund is a Tay Cities Region Deal project and is delivered in collaboration with The Scotland 5G Centre, as technical delivery partner for each of the projects, and industry partners. This competitive funding initiative aims to accelerate the development of innovative projects utilising the power of 5G technology to transform various sectors. It's supported with around £430,000 of Scottish Government funding as part of its £2million investment in Tay5G. Four winners were awarded as part of this Challenge Fund, including Scotland Re:Design with its project Hidden Floors.

tay5g.com



Scotland Re:Design

As one of four winning projects of the Tay5G Challenge Fund, Scotland Re:Design's project Hidden Floors, introduce Dundee and other fashion and textile businesses to 5G technology capabilities, through creating garments and sustainable virtual fashion and fabrics for sale, showcased in a digital runway and exhibition, which, without walls, can all be any size or scale.

SR:D is a national not-for-profit social enterprise that supports the Scottish Fashion, Accessories & Interiors industry. It fundraises, lobbies & creates awards, mentoring, exhibitions & events, including an annual programme in Scotland, & one-off showcases & business development in NYC, Chicago, Paris & Hong Kong. For the Tay5G project they have worked with a network of Dundee fashion and textile designers, artists and businesses to create digital experiences with industry across Scotland, including a runway and exhibition, and new collections, to create a use case of 5G technology.

By creating experiences in virtual and augmented reality with collaborators, audiences will be able to access events without floors through 5G in a display called "Hidden Floors" at V&A Dundee. This will be launched during a busy Opening Night Runway Gala in November. In addition to answering capacity challenges for the regularly sold-out festival at the V&A Museum, this 5G case study will explore how Dundee's businesses and places show, sell, and develop their capacities using 5G in their premises.

redesign.scot

SR:D



Designed by Shanagh Penman



The Scotland 5G Centre

The Scotland 5G Centre is the national centre for accelerating the deployment and adoption of 5G connectivity in Scotland's Industry and Public Sectors.

Funded by the Scottish Government, the Centre is uniquely positioned with connections to industry, telecom providers and academia – allowing the team to work collaboratively and support the delivery of advanced communications solutions, future proofed to unlock Scotland's digital potential. They provide a wide range of expert, impartial and transparent services free to all Scottish-based private and public sector organisations. Providing businesses access to leading industry experts and access to nationwide private 5G testbed facilities.

Tay5G Project

As part of the Tay5G project, The Scotland 5G Centre's technical team worked with Scotland Re:Design to create 5G connectivity options for the project. This included surveying and deploying 5G coverage for each of the sites – each creator's studios, the Opening Night Runway Gala at the V&A and the 'Hidden Floors' immersive experience, providing the 5G MIFI Units and integrating the 5G SIMs, and providing expert advice and technical support.

Each creator was provided access to The Scotland 5G Centre's Private Network to allow them a secure environment to work within, and the V&A Museum was also provided with access to the Dundee City Council 5G Private Network for the Opening Night Runway Gala and the 'Hidden Floors' Immersive Experience.

scotland5gcentre.org/tay5g/

Hidden Floors Teams

4 Dundee fashion, knit, print and textile designers were put into 4 teams led by Scotland Re:Design, to work with an applied artist from Applied Artist Scotland, an architect from Lateral North and the team at Fashion Interrupted.

Fashion Interrupted explores new ways of working in fashion through immersive collaboration. Pushing beyond the limits of physical materials, with an aim to showcase the work of artists and makers in new and innovative ways, Fashion Interrupted expands the possibilities of fashion through digital representation and experiential design. The Fashion Interrupted team is multidisciplinary and includes digital producers and a make-up artist working across Clo3D, Substance Painter, Blender and Daz3D to create digital garments, avatars and AR experiences.

Lateral North offer a variety of design-led services that map data and offer unique multi-disciplinary skills; from graphic and website design to photography and photogrammetry; from filmmaking and drone shots to community engagement and education toolkits. Lateral North are architects responsible for building the 'Hidden Floor' of the V&A Dundee.

Applied Arts Scotland is a membership organisation run by makers for makers delivering tangible benefits by connecting the community and facilitating practical opportunities for creative and professional development.

Each team have worked together, utilising each others expertise to create a virtual exhibition space called "Hidden Floors" showcasing digital models and garments from each designers' collections. This opportunity has given each designer the chance to learn a new design specialism and new insight of the capabilities of 5G and what it can do for small fashion businesses.

The Metaverse and Why 5G?

The Metaverse is the emerging 3D-enabled digital space that uses virtual reality, augmented reality, and other advanced internet like 5G, to allow designers to have lifelike business experiences online. They can explore virtual 3D spaces where they can learn, create and collaborate on life-like garments/fabrics with other designers or clients who are located elsewhere. Once complete they then can also showcase their fashion collection via virtual runway/exhibition.

High Download Speeds and Capacity

For the "Hidden Floors" at the Fashion Gala, each of our designers in collaboration with their team have created a life-like highly detailed 3D fashion collection on the Metaverse which is stored in the cloud. This content requires significant download speeds to provide a high capacity immersive VR experience.

Adaptable Network

The location of the "Hidden Floors" exhibition is located around a busy exhibition centre (V&A Dundee), and the installation needed, had to be adaptable to align with the varying deployment locations.

Flexibility

Pay-as-you-go 5G Data SIMs in 5G MIFI Routers provides high performing internet access for Quest 2 VR Headsets. It has allowed each designer to collaborate over a high capacity reliable network in various/changeable locations. This solution is flexible, reusable and innovative.



Megan McKay: Little Peril

Megan McKay, is an award-winning designer and is the visionary behind Little Peril Studio, a sustainable and uplifting fashion brand located in the heart of Dundee, Scotland. In May 2020, Megan embarked on her entrepreneurial journey, launching her brand "Little Peril" amidst the challenges of the Covid-19. At Little Peril, their commitment lies in crafting slow fashion essentials that prioritise quality over quantity. Their garments are meticulously fashioned from upcycled, recycled, and sustainable materials, all in alignment with their ultimate goal of achieving zero waste. Currently, they are in a phase of growth and are excited to expand their online clothing range, with e-commerce being their primary sales channel.

Working with Tay5G on the 'Hidden Floors' project, Megan is partnering with artist Ann Marie Shillito, known for her use of 3D technologies to make plastic precious, thus creating sustainable jewellery. Their theme of connectivity, blending Little Peril's signature lilac, silhouettes, and artistic flair with Ann Marie's non-gravity creations, explores the virtual reality space. For designer Megan McKay, this project serves as a gateway to boundless creativity, transcending physical barriers and venturing into a realm where the possibilities are limitless. Working together as part of the 'Hidden Floors' project, their sub-theme delves into the concept of 'Connection,' investigating intriguing parallels between technological circuits and micro-organisms found in the natural world. They also explore how form, shape, and pattern serve as expressive manifestations of this theme.

5G technology is the cornerstone of the 'Hidden Floors' project, enabling seamless access to the virtual realm and real-time exploration of cutting-edge software. This lightning-fast connectivity is indispensable when collaborating with artists and designers dispersed across the UK. In today's ever-evolving landscape, virtual reality and interconnectivity are the core of growth not only for the fashion sector but also for numerous other industries. As a small business, gaining access to this transformative network is nothing short of revolutionary. It empowers us to engage in training, development, and embrace the software tools of the future, positioning us on the cutting edge of innovation.

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As a small business, gaining access to this transformative 5G network and technology is nothing short of revolutionary.

Megan ”

Applied Artist
Ann Marie Shillito



www.littleperil.com
[Instagram/@littleperilstudio](https://www.instagram.com/littleperilstudio)
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Samantha Paton: Isolated Heroes

Samantha Paton is the founder of the multi award winning e-commerce brand "Isolated Heroes", one of the first independent brands in Scotland to champion body positivity, by developing collections in a size range accessible to all. Samantha's career spans from working on exciting celebrity stage wear and red carpet moments to creating bi-monthly limited edition drops for her e-commerce store. With over eleven years experience in the fashion and textile sector Samantha has worked on projects including designing collections for V&A Dundee "Night Fever" exhibition, a plus size collaboration with retail giant Urban Outfitters and creating immersive #SequinSquad shoppable experiences in St James Quarter, Princes Square and London based West Carolina.

Through the Tay5G project, Samantha is partnering with knitwear designer Maija Nygren to develop a digital collection which explores a modular design concept for a plus size market. The current plus size clothing sector in the United States alone is valued at \$288 billion with limitless potential and the plus size consumer is woefully underserved. Through a codesigned digital collection both designers are creating pieces which can evolve and grow through audience participation allowing the consumer the choice to add to their end design. Each garment within the collection pulls on both Maija and Samantha's previous work and specialties infusing traditional knitwear techniques with modern sequin fabrics.

As a designer Samantha has a large international client base and the use of 5G is crucial to providing a specific service to Isolated Heroes international audience and securing future business growth. The ability to create an avatar to their client's body measurements and showcase this through VR allows their clients to be part of the design process of their garments and lets customers view fabric choices in a digital realm which contributes to their sustainable practices. Through providing advance training and access to software, 5G and headsets, the Tay5G "Hidden Floors" project is future proofing the Scottish fashion and textile industry and allowing small businesses room to grow and develop.

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The use of 5G is crucial to providing a specific service to Isolated Heroes international audience and securing future business growth. ”

Samantha

Applied Artist
Maija Nygren



www.isolated-heroes.com
[Instagram/@isolatedheroes](https://www.instagram.com/isolatedheroes)
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[Pinterest/isolatedheroes](https://www.pinterest.com/isolatedheroes)

Jolene Guthrie: Jo-AMI

Jo-AMI was established in 2019 by Dundee MA Knitwear designer, Jolene Guthrie. Jo-AMI aims to promote the iconic Scottish knitwear industry, by creating garments and accessories that are cool, comfy and considered. Their designs retain key Scottish nostalgic traits but developed into stylish pieces for the modern-day customer. Jo-AMI is innovative, relevant and creative, producing collections that subvert the traditional notion of knitwear with a fun individual aesthetic, distinctive style and strong use of colour.

Jolene completed her undergraduate BDes degree in Textile Design at Duncan of Jordanstone College of Art and Design, Dundee, and furthered her knowledge into the Knitwear specialism through a Master's degree with distinction at Heriot Watt University, Galashiels. She then worked in various design internships over Scotland and finally as a full-time knitwear designer based near London for a year, before returning to Dundee and starting her own brand, Jo-AMI. She has been developing her knowledge on the electronic knitting machines and learning how to operate the programming software. Before production, she creates a digitised version of her knitwear designs and develops these designs through her computer, minimising any waste and unnecessary development time and knitting. This has been instrumental in her design process and production work.

Through the Tay5G project, Jolene is expanding her knowledge on emerging technologies through the use of 5G. With the help of applied artist, Aubin Stewart, Jolene has been creating new digital knitwear designs and custom avatars through a 5G enabled virtual environment, allowing her to develop her brand aesthetic and expand her design skills. This experience has given Jolene the opportunity to learn about 5G, it's capabilities and the potential it has to positively impact small businesses like Jo-AMI. This new-found knowledge will allow her to develop her business, taking a different approach to design development and custom orders in a 5G enabled virtual world which will bring many benefits such as saving development time, costs, materials wastage and problem shooting.

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The Tay5G project has allowed me to develop my skills and explore a different approach to design development through the use of 5G enabled VR tech.

Jolene ”

Applied Artist
Aubin Stewart



www.jo-ami.com
[Instagram/@joamistudio_](https://www.instagram.com/joamistudio_)
[Facebook/JoAMlstudio/](https://www.facebook.com/JoAMlstudio/)
[LinkedIn/jolene-guthrie](https://www.linkedin.com/in/jolene-guthrie)

Ruby Coyne: Dreamland

Ruby Coyne is a Dundee born and bred fashion designer. Her label Dreamland Clothing released its debut collection "Welcome to Dreamland" in 2015, developing a large fashion following through her vintage inspired 1980s style, offering a fresh, vibrant take on nostalgic classics. Sustainability is at the forefront of each part of the label, using recycled, zero waste fabrics within the collections.

Their vintage clothing line allows them to archive a whole range of nostalgic classics that would otherwise end up in land fill, bringing new life back into old clothing. Their current AW23 collection 'Upside Down' is inspired by 1980s pop culture focusing on the use of colour and shape within the new digital print, curated the collection by using a mix of recycled materials and new processes in digital printing.

For the Tay5G project, Ruby Coyne is working with applied artist Carrie Fertig, a multi-disciplinary artist who specialises in video, performance, installation, sound, sculpture and virtual reality. Both are working on a new concept and enjoying the journey of research, development and exploration of combining their skills to create outcomes with a focus on the VR landscapes.

5G has been an incredible asset, the superpowered connection and VR technology has opened Ruby's eyes to the future and possibilities it can bring – from connecting with customers worldwide, opening doors for collaboration with other designers and ultimately having a strong network connection for running her small e-commerce fashion brand. Creating these incredible new virtual landscapes has been exciting experience for Ruby. The possibilities with this software powered by 5G has allowed Ruby to look ahead and open her mind up to potential new opportunities. This ground-breaking new technology and software powered by 5G is something small designer can benefit from and without this Tay5G project they wouldn't have had the access to these facilities and expertise.

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5G has opened my eyes to the future and possibilities it can bring when running a small e-commerce fashion business.

Ruby

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Applied Artist
Carrie Fertig



www.dreamlandclothing.co.uk
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