
E-Textiles Network

Keynote and Invited Speakers

Christian Dalsgaard – *Keynote Speaker*

Founder and Chief Technical Officer, Ohmatex

Textile integrated wearables in space and on earth:

This talk will explore processes and techniques for the creation of textile integrated wearables for astronauts on the international space station ISS. Since 2010, Ohmatex has worked for the European Space Agency ESA to develop training tights for monitoring muscle activity and fluid shift in zero gravity. The focus will be on micro-electronic and sensor integration into textiles and how space development can be utilized in commercial spin-off applications for athletes and in a new generation of medical devices.

Malte von Krshiwoblozki – *Keynote Speaker*

Group Manager System on Flex, Fraunhofer Institut

E-Textiles Technologies – Merging Electronics and Textiles:

The market for electronic textiles is expected to grow rapidly during the next years. Textile based sensor and actor systems as well as robust power and data transfer through textiles will play an important role in the next generation wearable e-health, fitness, and defence/security market. In particular, textile based systems offer lucrative opportunities because they are stretchable, breathable and flat, and easily conform to the shape of the human body. However, technological challenges have to be overcome to handle the harsh and diverse applications of textile based wearable electronic systems. This talk will provide an overview of different technologies suitable for the textile circuitry manufacturing. Also, the available diversity of suitable conductors such as metallized polymer yarns (which can be used as electrodes), or special copper litz wires will be discussed. Additionally, general challenges to integrate electronics into textiles will be outlined and interconnection technologies to merge electronics with different textile circuitries will be presented. Finally, results of recent e-textile projects will be presented.

Dr Anura Fernando

Lecturer in Knitting of Advanced Materials, University of Manchester

Graphene coated sensor yarn for composite preforms:

There is extensive research to demonstrate that textile fibre reinforced composites are able to produce high strength and stiffness, at a low-weight allowing them to become excellent candidates for applications requiring improved strength and lighter structures compared to their metallic counterparts. Despite these impressive properties, textile composites are susceptible to damage that prevails from matrix cracking, delamination and finally damage to their reinforcing preforms. The initiation and the progression of damage mechanism, within textile composites, is a complex phenomenon that is very difficult to predict; due to which, there is currently great effort in to incorporating multiphysical parameter sensing capabilities in to textile preforms. In this regard, the electroconductive sensing yarns produced through the coating with recently discovered 2D nanomaterials have emerged as a promising way of monitoring the health and integrity of various engineering materials including composites for healthcare, sportswear, space, and military applications. Among these sensor property imparting coating materials, graphene has become one of the most investigated of materials in the recent times. The research presented discusses some of the recent achievements in producing graphene coated sensing fibres for incorporation in to textile preforms.

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Mark Catchpole

Commercial Director, Conductive Transfers

Crossing the Seam:

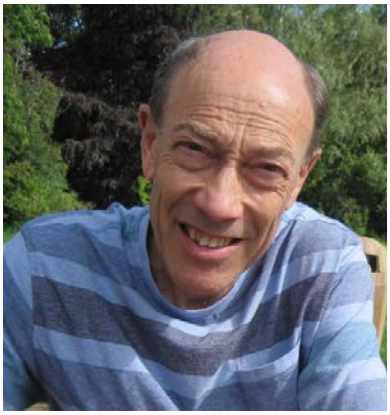
Today's wearable technology such as the smartwatches developed by Apple and others continues to use the electronics in a box form factor limiting its functionality. Conductive thread technologies with the potential to "disappear" such as Google's Jacquard subsequently incorporated into a Levi's Jacket have failed to achieve commercial traction whilst printing circuits onto TPU compromises a garment's comfort and fit. Other challenges include the integration of electronics assembly processes into the textiles industry, washability, price and seam crossing. This talk will discuss Conductive Transfers' novel approach to meeting these challenges illustrated with some insights from manufacturing and supplying circuits to our lead customer Atlantic Therapeutics' for their Innovo product used to treat urinary incontinence.

Prof. Henry Yi Li

Professor and Chair of Textile Science and Engineering, University of Manchester

Smart E-Textile Wearable Technology Developments:

In this presentation, the development of smart e-textile wearable technologies and standards in IEC and ISO will be reviewed, together with introduction of relevant initiatives in the University of Manchester. The relevant research projects in the university and in collaboration with many EU partners are introduced. The key challenges are identified and key initiatives in different regions are reviewed and discussed to reveal the potential opportunities and strategic developments of future textile wearables and standards.



Prof. John Wilson

Co-Director, Power Textiles Limited and Emeritus Professor of Physics, Heriot-Watt University

Photovoltaic Solar Textiles:

Solar cells are an option for powering active electronics on textiles but should be fully integrated to avoid compromising the flexibility and handle of the basic fabric. Photovoltaic (PV) cells conventionally use rigid silicon wafers but there are thin-film options offering acceptable performance (with cost and fabrication advantages) although some are sensitive to moisture and oxygen, and others require process temperatures outside the range of most flexible materials. Coating on fabrics is also influenced by their texture, elasticity and surface roughness. The demands of a flexible structure affect the choice of the other parts of PV cells, namely their electrical contacts and any encapsulation layers. The two alternative routes to a textile PV design are: (i) coat the fabric with the successive layers needed to make a sandwich device, or (ii) coat individual yarns with these layers and then process them into a fabric, e.g. by weaving. The pros and cons of both will be discussed. Our own textile PV construction will be explained, for woven polyester using thin-film silicon. This includes methods for ameliorating the electrical discontinuities that a woven fabric presents on flexing. The resulting performance is a trade-off between layer thicknesses and light-to-electricity conversion, stiffness against flexibility.

Venue and Directions

Friends House, 173/177 Euston Road, London, NW1 2BJ

Near to Euston rail and tube station and a close walk from King's Cross and St Pancras International stations. Please note there is no parking on site and delegates are advised to use public transport where possible.

Contact Us

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