# RAE 2020 CraftTech

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## CraftTech

#### **Descriptor (300 words)**

CraftTech investigates hybrid design frameworks and the integration of craft anad technology for interactive material design. Most existing research indicates a skewed emphasis on technological functionality and the finished product. Previous research on Polymeric Optical Fibres (POFs) has focused primarily on functionality and the finished product while this research focuses on the development process.

This research involved international practitioners from different disciplines. The research highlights the reflective and evolutionary nature of design practice and how it contributes to the creation of smart materials. The impacts of the research are:

•an understanding of how hybrid frameworks contribute to the design of smart materials and products

•established reference points within design discourse and reflecting on how practice contributes to design research

The research demonstrates how a range of collaborative expertise from different disciplines can contribute to the development of hybrid products. The process requires a balance of concepts, methods, and techniques. The reflective nature of the design framework allows practitioners to refine the designs by incorporating new findings throughout their practice. The research of the fundamental hybrid design frameworks will contribute to the sustainable development of innovative smart materials.

This body of work had been exhibited at the Victoria and Albert Museum (May, 2018) and at a peer-reviewed exhibition (By Annie Warburton, Creative Director of the Crafts Council) at the Hong Kong Museum of Medical Science (March, 2018). Tan publicly lectured on this research at the Parsons School of Design, USA (July, 2018), and during her design residency at Shih Chien University (December, 2017). The research has been disseminated via a journal publication, two conference proceedings, three exhibitions; one exhibition book and successful competitive bidding of one PhD student for project sustainability. The research process involved experimental workshops, prototyping and interdisciplinary research with designers, architects, and engineers for more than three years.

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### Jeanne Tan

Jeanne is a textiles and fashion designer. Her practice informs her research and vice versa. Her work investigates the interface of design and technology; integrating traditional craft and engineering as the syntax of the creation's narrative. Jeanne's research focuses on interactive textile design, hybrid design approaches and smart wearables.

#### **Research Questions**

This practice based research sets out to investigate

- How practitioners from different disciplines develop hybrid design processes to design smart materials and products.
- How hybrid approaches will bridge the gap between traditional craft and technology.
- How design and technology may be integrated within a physical artifact to develop alternative communication platforms.

## What constitutes the research output/ body of work

This body of research comprises of the following outputs:

Journal Tan, J. and Toomey, A. (2018) CraftTech: hybrid frameworks for textile-based practice. Journal of Textile Engineering and Fashion Technology. 2018;4(2):165–169. DOI: <u>http://dx.doi.org/10.15406%2Fjteft.2018.04.00135</u>

<u>Exhibition Book</u> Tan, J. & Toomey, A. (2018) CraftTech, London: Royal College of Art, March 2018. <u>http://hdl.handle.net/10397/73097</u>

#### **Exhibitions**

Tan, J. & Toomey, A. (2018) CraftTech exhibited at the Victoria & Albert Museum, London. UK. As part of the Digital Design Drop-In on 26 May 2018. Tan, J. & Toomey, A. (2018) CraftTech exhibited at The Hong Kong Museum of Medical Sciences, 6-11 March 2018. Reviewed by Annie Warburton, Creative Director, Crafts Council (UK).

Tan's contribution to the research are:

- Interdisciplinary design framework that integrates fashion design, textile design and technology
- Expand possibilities for interactive materials via craft and technology methods.

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This body of work (comprising of publications, exhibitions, sketchbooks videos) that studies and how interdisciplinary design processes affect the creation of smart materials that are used as alternative communication platforms. The showcased research is based on the studies conducted in two international collaborative workshops that brought together practitioners across many disciplines (textiles, fashion, millinery, electronic engineering and textile technology) to experiment, develop and create. The research investigates how hybrid design processes adapt, refine, improve new technology and vice versa. This research documents and study the balance of interdisciplinary methods and processes via design practice.



### **Research Field and Key Works Referenced**

Fast evolving nature of contemporary lifestyles see an increasing demand for smart materials that can adapt to the changing needs of the consumers. While the market for smart materials is forecasted to be worth USD \$80 billion in 2020 (Housely, 2016), there are few existing research which investigates the fundamental design processes for smart materials. Current studies focus on the technical application and functionality while neglecting the integral development process. The tendency to skew research and development towards a technology focus may have resulted in biased products that are not readily adopted by the mass market. As noted by Dunne (2015), many existing smart wearables have little regard for aesthetics and are inconvenient to maintain thus consumers are unlikely to utilize in their everyday lives. Within the context of smart textiles, it is important to note while technology is relatively new, the methods for textile making and construction had fundamentally remained unchanged since the 1800's with the mechanization of weaving, and sewing looms. Little had been discussed about how fashion and textile techniques accommodate technological functions with components and how the technology affects the way in which the smart materials are designed and created. Utilizing photonic textiles and polymeric optical fibres (POFs) as mediums, the research presented in this body of work explores hybrid design frameworks that utilizes interdisciplinary approaches. The process of 'making' is critical to this practice based research; it explicitly studies the practitioner's perspective when synergizing design and technology.

## **References for CraftTech**

- 1) Housely S. The Future of wearable tech. WGSN. 2016.
- 2) Dunne L. Smart clothing in practice: Key design barriers to commercialization. Fashion Practice. 2015;2(1):41–65.
- 3) Igoe E. The tacit-turn: Textile design in design research. Duck J Research in Textiles & Textile Design. 2010:1–11.
- 4) Tan J. Photonic fabrics for fashion and interiors. In: Tao XM. Editor. Handbook of Smart Textiles. New York: Springer; 2015:1005–1033.
- 5) Dunne L. Beyond the second skin: An experimental approach to addressing garment style and fit variables in the design of sensing garments. International J Fashion Design, technology & Education. 2010;3(3):109–117.
- 6) Toomey A, Kapsali V. D-STEM: A design led approach to STEM innovation. 5th STS Italia Conference. A Matter of Design: Making Society through Science and Technology. Milan: STS Italia Publishing; 2014:425–438.
- 7) Wong WC, Tan J, Luximon A. Design process of Interactive POF footwear. Paper presented at the Proceedings of Fashion: Exploring Critical Issues, 8th Global Meeting, Oxford: Mansfield College; 2016., no. 6, pp. 868-880.

#### **Research Methods and Materials**

collaborative This research is practice based. The research involved design process development, material experimentations and design process development with material designers, fashion designers, and engineers.

Due to the availability of equipment and studio environments, the research development were conducted at the Hong Kong Polytechnic University and The Royal College of Art.



E-sketchbooks can be accessed here. http://hdl.handle.net/10397/73097







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#### **Research Conclusion**

- This research documents the exploration of interdisciplinary design processes for designing smart materials and products in Hong Kong and the United Kingdom. The research involved practitioners from different countries and disciplines. The research highlights the reflective and evolutionary nature of design practice and its contribution to the creation of smart materials. This research has:
- Built an understanding of how hybrid frameworks contribute to the design of smart materials and products
- Established reference points within design discourse and reflected on how practice contributes to design research.
- The project formed an exhibition, 'CraftTech', held at two locations, The Hong Kong Museum of Medical Sciences, Hong Kong, in March 2018 and Victoria and Albert Museum, London, UK in May 2018.
- The research shows how a wide range of insights and expertise from different disciplines contributes to the development of innovative designs. The process requires a balance of concepts, methods and techniques from different perspectives. Flexibility allows the practitioners to refine the designs by incorporating new findings from their practice.
- We maintain that the exploitation of craft practice and knowledge is essential to realise the potential of the smart wearables market. Moreover, we suggest that this hybrid approach can form the basis of exploratory work into yet unknown materials as the fundamental framework is applicable to many types of materials and scenarios.
- Building on rich data (in the form of research, material innovation and frameworks) gathered from the case studies, the next phase of the research would explore the development of physical artifacts as communication and sensory platforms. The continuous research of the fundamental hybrid design frameworks will contribute to the sustainable development of innovative smart materials.

(1 Journal Publication, 2 Exhibitions, 1 Public Talk, 2 Design Residencies, 1, 2 Conference Proceedings)

Year	Journal Publication
2018	Tan, J., Toomey, A., Warbuton, A. (2018) CraftTech: Hybrid frameworks for textile-based practice. Journal of Textile Engineering & Fashion Technology. 4(2) 165-169. DOI: <u>http://dx.doi.org/10.15406%2Fjteft.2018.04.00135</u>

#### Year Exhibitions and Exhibition Book

- 2018 Tan, J. & Toomey, A. (2018) CraftTech exhibited at the Victoria & Albert Museum, London. UK. As part of the Digital Design Drop-In on 26 May 2018.
- Tan, J. & Toomey, A. (2018) CraftTech exhibited at The Hong Kong Museum of Medical Sciences, July
  2018 2013. Reviewed by Annie Warburton, Creative Director, Crafts Council (UK).
- 2018 Tan, J. and Toomey, J. (2018) CraftTech: Hybrid Frameworks for Smart Photonic Materials, RCA ISBN: 978-1-910642-31-0. URI: <u>http://hdl.handle.net/10397/73097</u>



#### Public Talks and Design Residencies Year Tan, J. (2018) Interactive Materiality: Bridging the gap between craft and technology. Parsons School of 2018 Design, 14th July 2018. 2019

Tan, J. (2019) Design Residency at The Mills Fabrica, Tsuen Wan, Hong Kong. 24-28 June 2019.

2017 Tan, J. (2017) Design Residency at Shih Chien University, Taipei, Taiwan. 6-17 December 2017.



Year	Conference
2018	Toomey, A & J. Tan (2018) INTERROGATING D-STEM: A DESIGN LED APPROACH TO STEM INNOVATION, ICERI2018 Proceedings, 12-14 November, 2018 , pp. 2964-2969. DOI: <u>10.21125/iceri.2018.1665</u>
2018	Tan, J., Toomey, A., and McLean, F. (2018) Technically Craft: Interdisciplinary Design Practice for Interactive Textiles. Proceedings: Textile Institute World Conference, Leeds, UK. 23-26 July 2018.