


# EPD Faculty Research

## A QUICK GUIDE

 **Energy & Sustainability**

 **Robotics & Electronics**

 **Biomedical & Healthcare**

 **Design Science & Engineering**

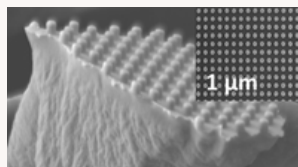
 **Optics & Nanophotonics**




**Prof. Low Hong Yee**  
EPD Head of Pillar

 **Energy & Sustainability**

 **Biomedical & Healthcare**



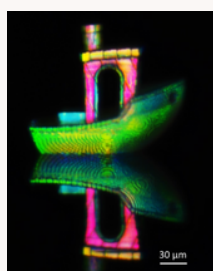
Her research focuses on designing and fabricating biomimetic surface topographies in soft materials. This work has led to the development of functional nanosurfaces for applications in mechanobiology, polymeric optical films, dry adhesives for biomedical and robotic devices, and polymeric films for energy. Her work also explores the scalability of these nanosurfaces via continuous film processes, nano-injection molding, and additive manufacturing. Recently, her research includes digital knitting of electro-mechanically functional textiles.

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**Prof. Joel Yang**  
EPD Associate Head of Pillar (Research)

 **Optics & Nanophotonics**



His interest is in nanotechnology applications in optical information security and anticounterfeiting. By controlling light-matter interactions at the nanoscale, he aims at hack-resistant optoelectronic devices (photodetectors and color pixels), and structural colors, where dye-free colors are generated from microscopic structures. His group develops advanced patterning capabilities to realize nano-device designs in 2D and 3D using Two-Photon Polymerization Lithography (TPL) and Electron-Beam Lithography (EBL).

 [joel\\_yang@sutd.edu.sg](mailto:joel_yang@sutd.edu.sg)




**Assoc. Prof. Foong Shaohui**  
EPD Associate Head of Pillar (Education)

 **Robotics & Electronics**




His research interests include applied magnetic and field-based sensing, intelligent mechatronics, nature-inspired robotics, and unmanned systems. At SUTD, he advanced his doctoral work on magnetic-field-based localization, securing grants for medical instrument localization. His patented technology in passive magnetic localization is now licensed for commercialization. He has expanded magnetic field applications to robotics and automation, developing nature-inspired rotor crafts that use Earth's geomagnetic field for control.

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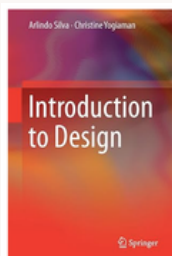
 **Design Science & Engineering**

 **Optics & Nanophotonics**




**Assoc. Prof. Arlindo Silva**

 **Design Science & Engineering**



His research encompasses engineering design, design science, and product development, with a focus on creativity and materials selection methodologies. His work also includes additive manufacturing in composite structures and managing uncertainty in design.

 arlindo\_silva@sutd.edu.sg



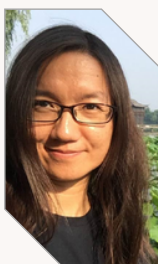
**Assoc. Prof. Dawn Tan**

 **Optics & Nanophotonics**



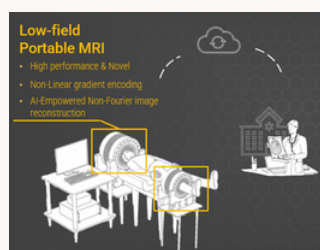
Her research focuses on nonlinear optics, integrated photonics, optical signal processing, and topological photonics. Her group designs novel devices to study nonlinear optical phenomena, leading to high gain optical amplifiers, new soliton behaviors, frequency combs, and topologically protected wavelength conversion. They also work on enhancing high-speed data transmission with spectral light generation and advanced modulation, emphasizing CMOS-compatible processes. Her team handles design, numerical modeling, fabrication, and experimental characterization of these devices.

 dawn\_tan@sutd.edu.sg




**Assoc. Prof. Huang Shaoying**

 **Biomedical & Healthcare**




Her research interests include low-field portable MRI (magnets and coils), non-linear MRI image reconstructions, RF aspects of MRI, MR electrical property tomography, radiofrequency(RF)/microwave noninvasive/contactless sensing, wireless power transfer, and wideband RF/microwave components.

 huangshaoying@sutd.edu.sg

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**Assoc. Prof. Javier G. Fernandez**

 **Biomedical & Healthcare**

 **Energy & Sustainability**



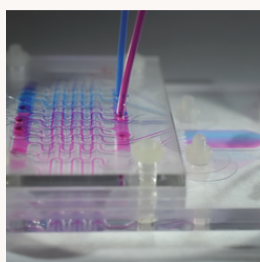
His work spans various fields, from tissue engineering to space exploration. He is particularly renowned for his contributions to sustainability through the development of bioinspired materials and structures, and the transformation of biological materials into engineering materials. He is the originator of the “Biomaterial Age” concept, which emphasizes using biomolecules and biological principles to instigate a technological paradigm shift, focusing on developing engineering systems as integral parts of a biological environment.

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**Assoc. Prof. Michinao Hashimoto**

 **Biomedical & Healthcare**



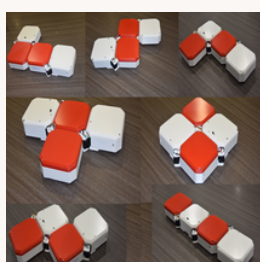
Michinao’s overarching research theme is microfluidics, both fundamentals and applications. Ongoing research topics include multiphase microfluidics, biomaterials formation, drug delivery, and development of medical and diagnostic devices. He is also interested in reducing the cost of science and technology, and making them accessible to broader range of people. Along this line, his research interest is on low-cost device fabrication and their application in point-of-care setting.

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**Assoc. Prof. Mohan Rajesh Elara**

 **Robotics & Electronics**



His research team undertake fundamental and demonstrative research to develop a full suite of enabling capabilities for reconfigurable robots. In addition to tackling key research challenges, his lab has developed the first demonstration of 15 distinct reconfigurable robots for applications in environmental, healthcare, education, manufacturing and marine industries.

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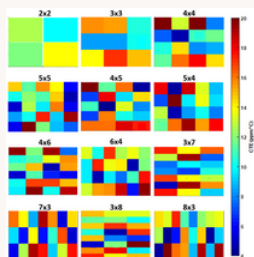
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**Assoc. Prof. Nagarajan Raghavan**

 **Robotics & Electronics**



His work focuses on lifetime prediction and physics of failure modeling of nanoelectronic devices including transistors, data storage devices and high power devices, prognostics and health management for battery cells and packs as well as AI-enabled design for electronic device reliability and development of robust neuromorphic hardware for edge computing.

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**Assoc. Prof. Pablo Valdivia**

 **Robotics & Electronics**



His research interests lie in the areas of soft robots and sensors, bio-inspired design, and advanced digital fabrication of soft multi-functional composites. He also focuses on the modeling and control of unsteady locomotion in fluids and conducts environmental studies.

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**Assoc. Prof. Soh Gim Song**

 **Robotics & Electronics**

 **Design Science & Engineering**




His research interests encompass kinematics, mechanisms and robotics, human-robot interaction, and hybrid wire arc additive manufacturing. At his research group, the Articulated Systems and Biomechanics Group, the group has been developing innovative computer-aided design tools, robotic systems, devices, and technologies to enhance the well-being, productivity, work quality, and safety of humans in the manufacturing, defense, and medical sectors


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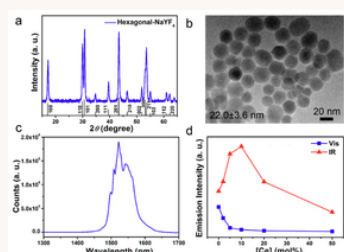
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**Assoc. Prof. Tan Mei Chee**

 **Energy & Sustainability**



Her research interests include the synthesis and modification of nanomaterials using solution-based processing methods, tailoring interfacial properties of nanomaterials and composites, and controlling material properties through advanced (micro)structures. She develops structure-property relationships for multiscale composite systems, focusing on the study and engineering of tailored interfaces to fabricate advanced multifunctional composites. She has extensive experience in designing and synthesizing photonic nanomaterials and functional composite systems.

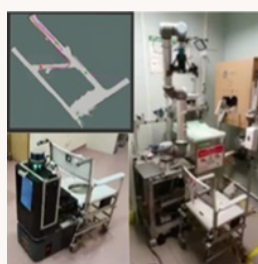
 [tanmeichee@sutd.edu.sg](mailto:tanmeichee@sutd.edu.sg)



**Assoc. Prof. Tan U-Xuan**

 **Robotics & Electronics**

 **Biomedical & Healthcare**




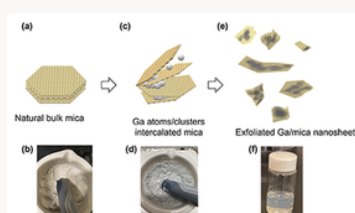
His research interest is in Robotics & Automation. His group has been designing various sensing and control algorithms for various applications cutting different industry. One example is in localization and mapping, where his group has been focusing on non-visible environment (eg: smoke, dust). His group also has a number of healthcare related robotics applications too.

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**Assoc. Prof. Wu Ping**

 **Energy & Sustainability**




His research interests focus on developing theory and applications for materials chemistry, aiming to design and fabricate new chemicals, structures, and products through a combination of computation and experimentation. He also explores affordable nanostructure fabrication techniques for sustainable energy and environmental applications. Additionally, his work includes computational thermo-chemistry, computational quantum chemistry, and materials informatics.

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**Prof. Yang Hui Ying**

 **Energy & Sustainability**



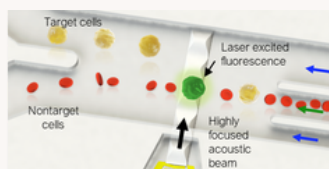
Her research interests include design and synthesis of nanostructures with well-defined functionalities and properties; rapid prototyping of energy storage devices; characterization of the functional materials with high performance analytical equipment; investigation of electrochemical performance with operando techniques; and development of carbon based materials for ion-sieving and ion removal techniques in liquid solutions.

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**Assoc. Prof. Ye Ai**

 **Biomedical & Healthcare**



His research focus is to develop innovative microfluidic technologies and biomedical devices for solving challenging biological and medical problems. His research group develops precise acoustic tweezing technology for single cell manipulation, biophysical cytometry for multidimensional label-free single cell analysis, and microfluidic molecular diagnostic devices. Dr. Ai has co-founded a start-up company, CellWave Technologies, to commercialize an acoustic fluorescence activated cell sorting system for high-purity single cell isolation without cell damages.

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