

### MESSAGE FROM HoP

A very warm welcome back to our EPD students in Terms 4 and 6. It is my honour to serve the EPD family as the interim Head of Pillar while the university continues its search for a new Head of Pillar. For our undergraduate students, there will be many site visits and workshops to look forward to this term, as well as a new Node. We will also continue to review the current curriculum to be more interdisciplinary and useful for job market. For the rest of our family, we are excited to engage you through faculty meetings, our EPD Living Room Sessions and our teambuilding event. Let us continue bringing EPD to greater heights and improve our spirit of innovation, design and collaboration!

### UPCOMING EVENTS

5 Oct	4 Oct
EPD 2D Event	Site Visit: Rhode & Schwarz
11 Oct (TBC)	13 Oct
Site Visit – Flex	Thales Arduino Workshop



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### ACHIEVEMENTS & ANNOUNCEMENTS

- Congratulations to **Joshua Loo**, who has been elected as the 4<sup>th</sup> EPD Pillar Representative for our undergraduate students. 
- "Biomedical and Healthcare Engineering" Track will be renamed to "**Healthcare Engineering Design**" track with effect from September.
- Our EPD noticeboard is up outside ARMS. Students may use the noticeboard for announcements.
- Congratulations to three of our faculty who have been promoted to **Associate Professor with Tenure!** They are Dr. Joel Yang, Dr. Zhao Rong & Dr. Low Hong Yee. 

*DESIGN is not just what looks like and what feels like; it's how it **works** – Steve Jobs*

### FEATURED : DESIGN MARGINS AS A STRATEGY FOR DESIGN EXPLORATION OF A DISTRIBUTED PROPULSION UAV

Tan Jun Yuan James (PhD), Professor Kristin L. Wood, Associate Professor Kevin Otto

**Description:** It is well reported in literature and industrial case studies that complex industrial systems suffer from certification, in-service reliability and life cycle issues due to design defects. Such deficiencies are often traced to poor design decisions early in design. This PhD dissertation proposes a novel approach of addressing them by using design margins as epistemic uncertainty buffers for early design of complex industrial systems. To achieve the research objective, a corporate design process in a typical aerospace corporation was studied, and the impact of design decisions was determined. It was found that design decisions during conceptual design had a significant impact on later observed design defects.

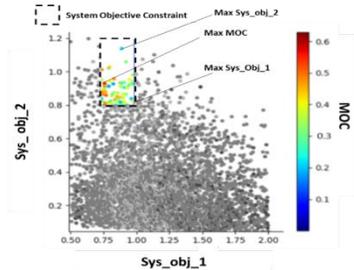
#### Design Margins

- Normalized difference between the constrained and available capacity of a component or system
- Different impact to various system level performance objectives variables
- Multiple design margins can combined be combined to a single trade-off variable; Margin on Components (MOC)

#### Recent Publications:

- Tan, J., Otto, K., & Wood, K. (2017). A Comparison of Design Decisions made Early and Late in Development. *International Conference of Engineering Design 2017 (Accepted)*
- Tan, J., Otto, K., & Wood, K. (2017). Relative Impact of Early versus Late Design Decisions in Systems Development. *Design Science (Accepted)*

#### Design Margin Trade-off in MDO Visualisation



#### Application: Design of a Distributed Propulsion UAV

