# APARM Special Session V

## Special Session Basic Information:

| Session Title | System Reliability for Industrial Applications: Modeling and Analytics |
|---|---|

### Introduction and topics

System reliability plays a critical role in ensuring the stable operation and performance of modern industrial systems, including manufacturing, logistics, energy, transportation, and computer-based infrastructures. As industrial systems become increasingly complex and interconnected, traditional reliability approaches are often insufficient to address challenges such as uncertainty, dependency, resilience, and dynamic operational conditions. This special session focuses on system reliability modeling and analytical methods with strong relevance to industrial applications. Topics include reliability modeling of complex systems, multi-state system analysis, degradation and time-dependent reliability, data-driven and AI-assisted reliability analytics, and practical case studies from industrial environments. Emphasis is placed on bridging rigorous reliability theory with real-world decision-making needs, enabling more reliable, resilient, and efficient industrial systems under uncertainty.

The special session welcomes original contributions on system reliability with strong relevance to industrial applications, including but not limited to the following topics:

- System reliability modeling and analysis
- Multi-state system
- Infrastructure resilience assessment
- Reliability optimization
- Monte Carlo simulation for reliability
- Data-driven reliability analytics
- AI-assisted reliability evaluation
- Industrial case studies on system reliability

## Special Session Chair(s):


| | |
|---|---|
| **Name** | Cheng-Fu Huang |
| **Prefix** | Prof. |
| **Department** | Department of Business Administration |
| **Organization** | Feng Chia University |
| **City/Region** | Taiwan |


### Organizer's Brief Biography

Cheng-Fu Huang received his B.S. degree in Industrial Engineering from Feng Chia University, Taichung, Taiwan, in 2004, his M.S. degree in Industrial Engineering and Management from National Chin-Yi University of Technology, Taichung, in 2006, and his Ph.D. degree in Industrial Management from National Taiwan University of Science and Technology, Taipei, Taiwan, in 2010. He is currently a Professor in the Department of Business Administration at Feng Chia University. His research interests include multi-state flow network modeling, network reliability evaluation, quickest path reliability analysis, Monte Carlo–based

simulation algorithms, and quality management. He has authored more than 60 papers in refereed international journals and actively serves as a reviewer for leading journals in reliability engineering and operations research.

| | |
|---|---|
| **Name** | Ping-Chen Chang |
| **Prefix** | Prof. |
| **Department** | Department of Industrial Engineering and Management |
| **Organization** | National Taipei University of Technology |
| **City/Region** | Taiwan |

## Organizer's Brief Biography

Ping-Chen Chang received the bachelor's degree from Chang Gung University, Taiwan, in 2005, the master's degree from the Department of Industrial Engineering and Management, Yuan Ze University, Taiwan, in 2007, and the Ph.D. degree in the Department of Industrial Management, National Taiwan University of Science and Technology, Taiwan, in 2013. He is currently a Professor with the Department of Industrial Engineering and Management, National Taipei University of Technology, Taiwan. He has published over 80 papers in refereed journals. His current research interests include stochastic network reliability, Monte Carlo simulation, and operations management. He was the recipient of the Ta-You Wu Memorial Award from National Science and Technology Council of Taiwan in 2022.