

# Pamela Tannous

PhD Candidate, Alleyne Research Group  
Department of Mechanical Science and Engineering  
University of Illinois at Urbana-Champaign

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## EDUCATION

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- Ph.D. Mechanical Engineering**, GPA 4.0 **Expected May 2020**  
University of Illinois at Urbana-Champaign, *Champaign-Urbana, IL*  
*Advisor*: Prof. Andrew Alleyne  
*Research area*: Estimation, Dynamical Modeling, Electro-thermal Systems, Fault Diagnosis
- M.S. Mechanical Engineering**, GPA 4.0 **August 2017**  
University of Illinois at Urbana-Champaign, *Champaign-Urbana, IL*  
*Advisor*: Prof. Andrew Alleyne  
*Thesis Title*: Dynamic temperature estimation of power electronics systems
- B.E. Mechanical Engineering** **February 2015**  
Lebanese American University *Byblos, Lebanon*  
*High distinction, Top 5% of applicants to the graduate program in the department of Mechanical Science and Engineering at the University of Illinois at Urbana-Champaign, 2015*

## RESEARCH AND PROFESSIONAL EXPERIENCE

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- Graduate Research Assistant, Alleyne Research Group** **August 2015 - Present**  
University of Illinois at Urbana-Champaign *Champaign-Urbana, IL*
  - Develop model-based estimation frameworks for power electronics systems
  - Develop model-based fault diagnosis strategies for electro-thermal systems
  - Design hierarchical model-based estimation approaches for electro-thermal systems
- Teaching Assistant** **Sep 2010 – Jan 2015**  
Lebanese American University *Byblos, Lebanon*  
*Course*: Computer Aided Engineering  
*Course instructor*: Prof. Ramy Harik
  - Prepared CATIA tutorials on stress analysis
  - Helped in lecture preparation
- Mechanical Engineer Intern** **June 2014 – July 2014**  
Otis Elevator Company *Mkalles, Lebanon*
  - Compiled and Standardized both sales and technical documentation for escalator/elevator product lines
  - Worked with potential clients to identify appropriate mobility solutions
  - Worked in a multi-disciplinary team.
- Mechanical Engineer Intern** **August 2013 – September 2013**  
INDEVCO Group *Halat, Lebanon*
  - Optimized manufacturing line to reduce footprint by 30%, operators y 50%, and increase productivity
  - Performed regular diagnostics for manufacturing line maintenance.

## PUBLICATIONS

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### Journal Publications

1. **P. J. Tannous**, S. R. T. Peddada, J. T. Allison, T. Foulkes, R. C. N. Pilawa-Podgurski, and A. G. Alleyne, "Model-based temperature estimation of power electronics systems," *Control Eng. Pract.*, vol. 85, no. April 2019, pp. 206–215, 2019.
2. **P. J. Tannous** and A. G. Alleyne, "Fault Detection and Isolation for Complex Thermal Management Systems," *J. Dyn. Syst. Meas. Control*, vol. 141, no. 6, p. 061008, 2019.
3. S. R. T. Peddada, **P. J. Tannous**, A. G. Alleyne, and J. T. Allison, "Optimal Sensor Placement Methods in Active High Power Density Electronic Systems with Experimental Validation," *J. Mech. Des.*, 2019.

### Conference Proceedings

1. **P. J. Tannous**, D. J. Docimo, H. C. Pangborn, and A. G. Alleyne, "Hierarchical Estimation for Complex Multi-Domain Dynamical Systems," in *American Control Conference (ACC)*, 2019.
2. **P. J. Tannous** and A. G. Alleyne, "Fault detection and isolation for complex thermal management systems," in *Proceedings of the ASME 2018 Dynamic Systems and Control Conference (DSCC)*, 2018.
3. **P. J. Tannous**, S. R. T. Peddada, J. T. Allison, T. Foulkes, R. C. N. Pilawa-Podgurski, A. G. Alleyne, "Dynamic Temperature Estimation of Power Electronics Systems," in *American Control Conference (ACC)*, 2017.
4. S. R. T. Peddada, **P. J. Tannous**, A. G. Alleyne, and J. T. Allison, "DETC2017-68253 Optimal Sensor Placement Methods For Active Power Electronic Systems," in *Proceedings of the ASME 2017 International Design Engineering Technical Conferences & Computers and Information in Engineering Conference (IDETC)*, 2017.

### Thesis

**P. J. Tannous**, "Dynamic Temperature Estimation of Power Electronics Systems," M.S. Thesis, Department of Mechanical Science and Engineering, University of Illinois at Urbana-Champaign, 2017.

## ORAL PRESENTATIONS

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1. "Hierarchical Estimation and Fault Diagnosis for Electro-Thermal Systems", *Technical Conference of the NSF Center for Power Optimization of Electro-Thermal Systems (POETS)*, May 2019.
2. "Hierarchical Estimation for Complex Multi-Domain Dynamical Systems", *American Control Conference (ACC)*, July 2019.
3. "Fault detection and isolation for complex thermal management systems", *ASME 2018 Dynamic Systems and Control Conference (DSCC)*, October 2018.
4. "Thermally-Aware Electrified Systems", *Technical Conference of the NSF Center for Power Optimization of Electro-Thermal Systems (POETS)*, May 2018.
5. "Dynamic Temperature Estimation of Power Electronics Systems", *American Control Conference (ACC)*, May 2017.
6. "Model-based Temperature Estimation of Power Electronics Systems", *Technical Conference of the NSF Center for Power Optimization of Electro-Thermal Systems (POETS)*, April 2017.
7. "2-D Dynamic Temperature Estimation of Power Electronics Systems", *Technical Conference of the NSF Center for Power Optimization of Electro-Thermal Systems (POETS)*, April 2016.
8. "Control-Oriented Dynamic Thermal Modeling of Power Electronics Systems", *NSF Center for Power Optimization of Electro-Thermal Systems (POETS) Web Seminar*, March 2015.

## POSTER SESSIONS

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1. "Hierarchical Estimation for Complex Multi-Domain Dynamical Systems", *Technical Conference of the*

*NSF Center for Power Optimization of Electro-Thermal Systems (POETS)*, May 2019.

2. “Thermally-Aware Electrified Systems”, *Technical Conference of the NSF Center for Power Optimization of Electro-Thermal Systems (POETS)*, May 2018.
3. “Model-based Temperature Estimation of Power Electronics Systems”, *Technical Conference of the NSF Center for Power Optimization of Electro-Thermal Systems (POETS)*, April 2017.
4. “2-D Dynamic Temperature Estimation of Power Electronics Systems”, *Technical Conference of the NSF Center for Power Optimization of Electro-Thermal Systems (POETS)*, April 2016.

## **WORKSHOPS**

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1. “COACHing Strong Academics in the Art of Strategic Persuasion”, *American Control Conference*, May 2017.
2. “Model Predictive Control Workshop”, *American Control Conference*, July 8-9th 2019.
3. “More-Electric Mobility”, *Centre for Power Optimization of Electro-thermal Systems (POETS)*, University of Illinois at Urbana-Champaign, October 2019.

## **PERSONAL ACHIEVEMENTS AND PROJECTS**

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### **Powertrains**

- Designing the powertrain of an electric car to participate in the Shell Eco-marathon competition.

### **Computer Aided Engineering**

- Modeling and simulating a four-stroke engine on CATIA.

### **Kinematics and Manufacturing**

- Designing and manufacturing a three-wheeled human powered vehicle.

### **HVAC**

- Designing an HVAC system for a residential apartment.

### **Sustainable Energy**

- Studied the potentials of producing all the power needed in Lebanon from sustainable energy sources (solar energy, wind energy, hydropower).

### **Project Management**

- scheduling the mechanical activities of a residential building using Primavera.

## **Service**

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### **Conference Coordinator, Student Leadership Council**

**August 2018 – August 2019**

- Organized the fourth annual technical conference of the NSF Center for Power Optimization of Electro-Thermal Systems (POETS).

### **Reviewer**

- IEEE Transactions on Industrial Electronics.
- Journal of Dynamic Systems, Measurements and Control

## **RELEVANT COURSEWORK**

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- Control Systems
- Control System Theory and Design
- Estimation and Data Assimilation
- Nonlinear and Adaptive Control
- Optimum Control Systems
- Engineering Design Optimization
- Dynamic System Design

- Analysis of Nonlinear Systems
- Computer Control of Mechanical Systems
- Robust Adaptive Control

## **COMPUTER SKILLS**

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MATLAB, Simulink, LabVIEW, CATIA, ANSYS, AutoCAD, and Microsoft Packages.