

Teal Dowd

Location: Lafayette, IN 47905

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OBJECTIVE

Materials Engineering PhD candidate (defending summer 2025) with a BS in Mechanical Engineering, seeking an R&D engineering role to apply expertise in integrating design (CAD), fabrication (machining, 3D printing, robotics), and automation (Python, Arduino) to transform complex requirements into functional prototypes.

EDUCATION

Purdue University, West Lafayette, IN

- Bachelor of Science, Mechanical Engineering 2014 – 2018
- Ph.D. Candidate, Materials Engineering 2018 – Present

PROFESSIONAL EXPERIENCE

Doctoral Candidate | Manufacturing Design Lab (MDLab) | Purdue University, West Lafayette, Indiana 2018 – Present

- Engineered a custom cycling testing rig to assess the precision of smart bicycle trainers and analyze bicycle chain efficiency, overseeing all aspects from design (CAD, part selection) to electrical integration and programming of a custom Python control program
- Facilitated testing of smart trainers in collaboration with the International Cycling Federation, providing critical data to inform quality standards for online cycling platforms
- Conducted comprehensive assessments of bicycle drivetrain lubricant efficiency under varying conditions using the testing rig, resulting in an extensive dataset covering a wide range of wax lubricants
- Analyzed lubricants to correlate material properties with optimal cycling efficiency, creating a comprehensive database from Differential Scanning Calorimetry (DSC), Rheometry, and Gas Chromatography-Mass Spectrometry (GC-MS) analyses
- Designed and fabricated various test fixtures and compact machinery—including a robotic gripper, automated winder, and bushing feeder—demonstrating innovative problem-solving

Research Assistant | Indiana Manufacturing Institute | Purdue University, West Lafayette, Indiana 2017 – 2018

- Designed and manufactured a molding tool for thermoset plastic tensile test coupons, enabling efficient and standardized sample preparation
- Utilized CAD/CAM software and CNC machining to fabricate aluminum pin brackets, enabling mechanical testing and direct performance comparisons against composite parts

Artisan Fabrication Laboratory Mentor | Purdue University West Lafayette, West Lafayette, Indiana 2014 – 2018

- Mentored students, providing training on machine safety, project design and fabrication.
- Instructed students in CNC programming (IPS/VQC/CAM) and operation of mills, lathes, laser cutters, waterjet, and 3D printers, empowering them to execute complex fabrication projects

Process Engineering Intern | Medtronic **Warsaw, Indiana** 2016

- Created proof-of-concept RFID time tracker using Raspberry Pi/Python, featuring GUI and SQL database for automated time logging
- Implemented VBA algorithms to filter and analyze over 100,000 lines of Excel data, extracting critical machine runtime information that informed efforts to reduce excess runtime and target inefficiencies

TECHNICAL SKILLS

3D Modeling: SolidWorks, Autodesk Inventor, PTC Creo, CATIA v5 (CAD and CAM)

Physical: 3D printing, rapid prototyping, TIG/MIG welding, manual and CNC mill, waterjet, laser cutting, 6-DOF robot programming, general electrical knowledge, forklift certified

Programming: Python, Arduino (C++), Git/GitHub, MATLAB, VBA

Selected Publications & Patents

- T. Dowd, D. Heflin, J. Miller, M. Rogers, A. Kraslinikau, and J. A. Mansson, "Apparatus and methodology for smart trainer homologation analysis," *Sports Eng.*, vol. 27, no. 1, 2024. DOI: 10.1007/s12283-023-00447-z
- T. Dowd, J. Miller, D. Heflin, W. Sweldens, A. Kraslinikau, and J.-A. Mansson, "Smart Trainer Homologation System," in *ISEA 2022 – The Engineering of Sport 14*, 2022. DOI: 10.5703/1288284317530
- T. Dowd, J. Miller, D. Heflin, J.-A. Mansson, and W. Sweldens, "Bicycle Trainer Homologation Apparatus," U.S. Patent 11,980,799, 2024.