Andrew Couch

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Education

Stanford University, *School of Engineering*, Palo Alto, CA — Ongoing
Doctor of Philosophy in Management Science & Engineering
GPA: 4.0/4.0

University of Alabama in Huntsville, *College of Engineering*, Huntsville, AL — May 2023
Master of Science in Industrial & Systems Engineering
GPA: 4.0/4.0

University of Alabama in Huntsville, *College of Engineering*, Huntsville, AL — May 2022
Bachelor of Science in Industrial & Systems Engineering
Industrial & Systems Engineering Student of the Year Award (Best Student in Class of 2022)
GPA: 4.0/4.0

Thomas Edison State University, *School of Business and Management*, Trenton, NJ — June 2018
Bachelor of Science in Business Administration, Major: General Management
Graduated at Age 17 Prior to Graduating High School
GPA: 4.0/4.0

Journal Articles

Couch, A., & Loyd, N. (July 2023). Internal and External Precursors to Favorable Adoption of Industry 4.0 Technologies. *Journal of Management and Engineering Integration*. (Accepted).

Couch, A., & Messimer, S. (July 2022). Incorporating Theory into Practice: A Historical Assessment of Layout Design and Bürolandschaft with Practical Applications to Modern Office Landscapes Using Performance Metrics. *Journal of Management and Engineering Integration*, 15(1), 33-44.

Conference Papers

Couch, A., Loyd, N., & Tenhundfeld, N. (May 2023). A Case on Integrating Industry 4.0 and Human Factors Engineering. *IISE Annual Conference*.

Couch, A., & Loyd, N. (October 2022). Gaussian Mixture Model and Bayesian Information Criterion in a Stochastic Demand System. *2022 AlaSim Modeling and Simulation Conference*.

Couch, A., Loyd, N., & Messimer, S. (September 2022). Applying Performance Metrics and Layout Design Theories to Real Systems. *IISE Lean Six Sigma and Data Science Conference*.

Couch, A., Budisalich, A., Maddux, G., Budisalich, K., & Lioce, L. (November 2021). Toenail Removal Simulator and Earwax Removal Simulator: 3D Printed Models for Enhancing Simulation-Based Experiences for Training Nursing Students. *2021 AlaSim Virtual Healthcare Simulation Technologies Conference*. (Peer Reviewed & Published).

Presentations

All journal articles and papers above were (or will be) personally presented by Couch, A. at their respective conferences.

Loyd, N., & **Couch, A.** (May 2023). Analysis of Industry 4.0 Through the Lens of Previous Industrial Revolutions. *IISE Annual Conference*. (Accepted).

Couch, A., & Loyd, N. (November 2022). Internal and External Precursors to Favorable Adoption of Industry 4.0 Technologies. *14th Annual Reliability And Maintainability Conference*.

Couch, A., & Loyd, N. (October 2022). Gaussian Mixture Model and Bayesian Information Criterion in a Stochastic Demand System. *IISE Lean Six Sigma and Data Science Conference*. (Poster Presentation).

Research & Technical Experience

National Institute of Standards and Technology (under U.S. Department of Commerce)
Engineering Research Fellow June 2023 – July 2023
Supervisor (P.I.): Dr. Yan Lu Gaithersburg, MD

- Surveyed existing business models, policies, and regulations for additive manufacturing.
- Uncovered barriers in technology, business process, public policies, and regulations that constraint additive manufacturing industrialization.
- Pioneered solutions in business models, policy, and regulations that could accelerate additive manufacturing adoption, industrialization, and research directions for the additive manufacturing community.

UAH Industrial & Systems Engineering and Engineering Management Department
Graduate Research Assistant Level II May 2022 – May 2023
Supervisor (P.I.): Dr. Nicholas Loyd Huntsville, AL

- Performed original research on cutting edge Industry 4.0 technology to create and enhance frameworks for accommodating corporate economic, managerial, and logistic issues that arise in modern complex decision environments.
- Created a statistical framework and leveraged simulation and optimization tools to obtain optimal operating conditions for stochastic systems.
- Analyzed the strategic climate of modern competitive marketplaces to craft methodologies for deploying Lean theories in profitable manners.
- Assessed the everchanging market dynamics to enhance the body of knowledge of corporate strategy from macroscopic (corporate trajectories) and microscopic (operational excellence) perspectives.

Dynetics Inc., Mechanical Design and Systems Engineering Department
Design Maturation and Test Engineering Intern May 2021 – August 2021
Supervisor: Dr. Diane Aloisio and David Ault Huntsville, AL

- Drafted, developed, and finalized test procedure reports for subsystem components as a primary deliverable to the customers of the Long-Range Hypersonic Weapon (LRHW) program.
- Assessed and monitored inventory resources while maintaining proper documentation and tracking measures.
- Coordinated and executed test procedures for hypersonic weapon system deliverables to stakeholder organizations under the LRHW program (https://www.dynetics.com/hypersonics/).
- Verified requirements are satisfied through the examination of drawings and hardware deliverables.
- Designed, developed, and produced mechanical components through the application of 3D Computer-Aided Design (CAD) software and production processes while considering the imposed stress and dimensional tolerance constraints.
- Assessed and selected requirement verification techniques and executed verification activities.

UAH Systems Management And Production Center (UAH SMAP Center)
Research Assistant II June 2017 – June 2022
Supervisor: Dr. Gary Maddux Huntsville, AL

- Researched simulation approaches to improving operations and training for the UAH College of Nursing and industry partners.
- Performed research to determine the most effective methodologies for the utilization of available human and material resources to address stakeholder deliverables.
- Interacted with stakeholders and performed needs assessments using various preference elicitation techniques in order to formulate a strategic design and development plan for the production and distribution of deliverables.
- Constructed 3D Computer-Aided Design (CAD) models for a variety of parts in order to satisfy imposed tolerance, material, and stress requirements.
- Utilized additive manufacturing techniques for the production of deliverables. Upgraded and maintained additive manufacturing techniques for the production of deliverables. Altered injection molding designs to specifically address the needs of various projects. Tailored injection molding resources and techniques to accommodate medical applications.
- Designed and implemented school safety measures at many local high schools to enhance the existing security capabilities (https://www.uahmednet.org/school-safety).

- Performed material analysis for the UAH College of Nursing to minimize their current cost baseline and to enhance the sustainability of the existing training equipment (https://www.uahmednet.org/).
- Developed realistic medical simulators for the UAH College of Nursing and presented research papers based on this work.
- Explored and researched techniques for utilizing the capabilities provided by additive manufacturing technologies and various molding processes to enhance existing medical and school safety technologies.
- Represented UAH on STEM educational outreach trips to high schools with depleted STEM education funds and resources.

Awards & Involvements

- Graduate Fellowship for STEM Diversity — $20,000/year, 2023
- IISE Lisa Zaken Award for Excellence Scholarship — $1,000, 2023
- Acquisition Innovation Research Center Data Science Team — Statistician, 2022
  - $30,000 awarded for 2^{nd} place national competition finish
- Mark Makima and Lester M. Ross, Senior, Scholarship in Engineering — $5,000, 2022
- Tau Beta Pi Engineering Honor Society (top 12.5% of engineering juniors) — Member, 2021
- Phi Kappa Phi Honor Society (top 7.5% among all juniors) — Member, 2021
- Alpha Pi Mu Industrial Engineering Honor Society — Member, 2021
- National Society of Leadership and Success — Invited to Join, 2020
- UAH Academic Excellence Scholarship — Full tuition
- President's List – The University of Alabama in Huntsville — All semesters
- Best Paper Award at the *2021 AlaSim Virtual Healthcare Simulation Technologies Conference*
- UAH Industrial & Systems Engineering and Engineering Management Department Advisory Board
  - Maintenance of program ABET and SACS accreditation (Student Representative)
  - June 2021 – May 2023

Salient Skills

- Customer interface and teamwork capabilities during design, development, and testing phases within the life cycle of projects
- Skilled with linear and multiple regression analysis, a variety of optimization algorithms, technical writing, building simulation models, inferential statistics, statistical modelling, queueing theory, and analyzing stochastic systems
- Proficient with Solid Edge, Minitab, Simio, Microsoft Office, Python, and developing proficiency with R and Creo

Standardized Test Scores

Graduate Record Examinations (GRE) General Test — August 2021

- Analytical Writing Assessment: 6.0 / 6.0
- Quantitative Reasoning: 170 / 170
- Verbal Reasoning: 155 / 170

Standardized American Chemical Society General Chemistry 1 Final Exam — July 2019

- 100th Percentile Nationwide

Licenses & Certifications

- Courses taught by Dr. Wayne Whiteman, P.E. from the Georgia Institute of Technology:
  - Mechanics of Materials 1: Fundamentals of Stress & Strain and Axial Loading
  - Mechanics of Materials 2: Thin-Walled Pressure Vessels and Torsion
  - Mechanics of Materials 3: Beam Bending
  - Mechanics of Materials 4: Deflections, Buckling, Combined Loading & Failure Theories
- Course taught by Dr. Daniel Egger from Duke University:
  - Business Metrics for Data-Driven Companies
- AGI Systems Toolkit Level 1 Certification — December 2019

- Six Sigma Black Belt Certification — July 2021
- Lean Six Sigma Green Belt Certification (UAH) — May 2021
- Lean Six Sigma Yellow Belt Certification (UAH) — December 2019
- Defense Acquisition University Coursework:
  - ACQ 1010 Fundamentals of System Acquisition Management
  - PMT 0160 Cost Estimating
  - PMT 3500 Business Aspects

Community Involvement

- Asbury United Methodist Church Food Pantry Volunteer – 10+ years
- Church of the Highlands – Shady Grove Trailer Park and Lincoln Village School Volunteer Service Outreach Events