Karim Sayyahin

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Education

University of Iowa, Iowa City, Iowa — Expected May 2026
B.S.E. Mechanical Engineering; Recipient of the Dean's List — GPA: 3.3/4
Focus Area: Design
Pursuing Certificate: Artificial Intelligence Modeling and Simulation (AIMS)

Relevant Coursework

Finite Element Analysis, Fluid Mechanics, Mechanics of Materials, Control Systems, Manufacturing Processes, Scientific Computing & Machine Learning, Design for Manufacturing, Thermodynamics and Heat Transfer

Skills

- Simulation & Analysis: Abaqus, ANSYS Workbench, Solid Mechanics, Stress Analysis, Mechanism Simulation, Introductory CFD (ANSYS Fluent)
- AI & Computational Tools: Python, NumPy, SciPy, Scikit-Learn, Bayesian Optimization, Data Pipelines, Model Validation, Feature Engineering, MATLAB
- CAD & Prototyping: AutoCAD, SolidWorks, Creo, CNC machining, 3D printing, rapid prototyping

Professional Experience

Mechanical Engineering Intern — June 2025 – Oct 2025
Resilience Inc., Tampa, FL

- Designed and prototyped the SALI desalination system, producing CAD assemblies, BOMs, and cost models that reduced projected build cost by 15 percent while meeting structural and thermal constraints
- Modeled thermal performance in MATLAB and improved prediction accuracy by 18 percent through experimental validation and parameter tuning
- Built and tested four full prototypes, tightening assembly tolerances and improving mechanical reliability by 30 percent across iterations
- Authored assembly and compliance guides enabling the system to be replicated in under 3 hours for STEM deployment

Design Associate — September 2024 – May 2025
Biology Engineering Shop, Iowa City, IA

- Designed and modeled custom experimental setups in AutoCAD and SolidWorks, integrating mechanical constraints, tolerances, and manufacturability
- Built and validated prototypes for 15+ research projects, achieving a 95 percent first-fit success rate through iterative refinement
- Optimized fabrication workflows and equipment setup, increasing lab throughput by 20 percent while maintaining dimensional accuracy
- Produced detailed 2D drawings and documentation used for experiments requiring precise mechanical behavior

Projects

Trading Algorithm – Data Pipeline & Bayesian Optimization — August 2025 – Present

- Built a snapshot based research pipeline in Python using DuckDB and Parquet, producing reproducible runs and organizing outputs across 6 stages: config, snapshot, rescore, validate, diagnose, refit
- Processed 15,162 news records across 3 sources, and engineered price and NLP features to support baseline models plus a TCN sequence enrichment signal used for risk map gating and sizing
- Developed 2 backtest paths (portfolio backtester and lightweight simulator) driven by 1 minute bars, plus 4 command line runners for rescore, training, scenario sanity backtests, and paper shadow cycles, reporting Sharpe, Sortino, CAGR, max drawdown, profit factor, exposure, and beta

John Deere Capstone Design — August 2025 – Present

- Estimated bolt clamp force from installation torque assumptions, translating to about 10.6 MPa average interface pressure over 374 mm by 320 mm contact footprint
- Built a material screening matrix for compressive loading using ASTM D695 and ISO 604 properties, ranking polymer and composite candidates by strength margin, creep resistance, and environmental durability
- Modeled multiple shim variants for fit and manufacturability, documenting assumptions, test observations, and design revisions