Jesse Anderson

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Education

University of Illinois at Urbana Champaign **Champaign, IL**

Master of Computer Science *August 2025*

- **GPA:** 4.00
- **Relevant Coursework:** Applied Machine Learning, Practical Statistical Learning, Distributed Systems, Methods of Applied Statistics, Cloud Computing Applications, Database Systems, Scientific Visualization, Data Cleaning

University of Illinois at Chicago **Chicago, IL**

Bachelor of Science in Chemical Engineering *May 2023*

Minor in Mathematics and Computer Science

- **GPA:** Major 3.82 | Minor 3.78 | Cumulative 3.77
- **Concentrations**: Process Automation and Biochemical Engineering
- **Relevant Mathematics and Computer Science Coursework:** Data Structures, Discrete Math, Linear Algebra, Industrial Math & Computation
- **Relevant Chemical Engineering Coursework:** Calculus I/II/III, Differential Equations, Computational Methods in ChE, Chemical Reaction Engineering, Programming for Engineers with MATLAB, Biochemical Engineering, Process Simulation with Aspen Plus

College of DuPage **Glen Ellyn, IL**

Associate's in Science *August 2019*

- GPA: 3.64

Work Experience

UL Solutions June 2023-April 2024

Engineer

- Design automation software in Python and VBA to eliminate 500+ hours of tedious workflows annually.
- Develop Python software with OpenCV/PyMuPDF to automatically detect and alert engineers of changes in CAD files.
- Establish ETL pipeline to reduce redundant analytical tasks by 240-555 hours per year dependent on incoming work.
- Determine project scope, preliminary plan of investigation, and project specifications to initiate technical projects in testing and verification of products to UL's standards.

United Conveyor Corporation May 2022- August 2022

Summer Engineering Intern

- Pioneered software to automate 150 hours/yr of data entry, comparison and analysis tasks.
- Developed software to improve analysis workflow bottleneck by 540,000% by eliminating manual data entry.
- Developed a software library for analyzing thermoplastic and thermoset properties to ASME/AWWA/PPI standards.

University of Illinois at Chicago August 2020-December 2021

Peer Leader, Calculus Based Physics

- Ensured student success in Calculus-Based Physics (Mechanics) via one-on-one and group tutoring through online platforms (Blackboard, Zoom) with a focus on problem solving methodology.
- Developed an automated attendance analytics program to measure student attrition in Physics I.

G5 Environmental June 2016 - August 2019

Safety/Project Manager

- Served as project lead at job sites by ensuring completion of contract requirements by CDL team members.
- Ensured safe execution of any mechanical repairs by mechanics.
- Acquired parts on an as needed basis to ensure that contracts serviced did not experience time offline

Technical Skills

Computational Skills:

- **Programming Languages:** MATLAB, Python, R, C++, Julia, VBA, VB.NET, FORTRAN, CUDA, JavaScript, HTML, CSS, Shell Scripting, Bash
- **Software & Tools:** SuperPro, Aspen Plus, SnapGene, Power BI, Tableau, Git, Markdown, SQL (MongoDB/PostgreSQL/MySQL/WASM DuckDB), OpenCV, PyMuPDF, PyTorch, Flask, BeautifulSoup, Jupyter Notebook, Anaconda, Docker, Kubernetes
- **Machine Learning & AI:** Classification, Regression, Clustering, CNN, RNN, NLP, LLM (local/API), Denoising Autoencoder, Variational Autoencoder, Generative Adversarial Network (GAN), TensorFlow, Keras, PyTorch, Explainability
- **Data Science & Analysis:** Pandas, sklearn, numpy, ETL Pipelines, Data Visualization, Matplotlib, Seaborn, Plotly, Scipy, Grafana
- **Cloud & APIs:** Google Cloud Platform (GCP), Amazon Web Services (AWS), pyMongo, PostgreSQL,SQLite3, RESTful APIs
- **IoT & Hardware:** Raspberry Pi, Arduino, ESP32, Circuit Design, Blueprint Interpretation, Parts Diagram Reading, Sensors (DHT11, DHT22, BMP180, Sensiron,...)
- **DevOps & CI/CD:** GitHub Actions, Cronjobs

Additional Skills:

- Strong problem-solving and analytical skills
- Translating business requirements into actionable deliverables
- Developing automation workflows from engineering input

Projects

Oak Park Crime Tracking[May 2025]
Developed an ETL pipeline to parse Oak Park crimes and place into a static web application using WASM DuckDB to map crimes over time. Updated daily using a Raspberry Pi, pushed to a weekly mailing list, and ML/AI enabled for forecasting/insights.

Pi Environmental Monitor Interactive Database[May 2024]
Developed a web-based ETL pipeline to monitor and visualize environmental data using a Raspberry Pi and DHT11 sensor. Collected data was pushed to MongoDB, PostgreSQL, ThingSpeak, and Google Sheets. The web interface dynamically displayed real-time temperature and humidity data in tabular and graphical formats.

VAE-GAN[University of Illinois at Urbana-Champaign][April 2024-May 2024]
Train a Variational AutoEncoder Generative Adversarial Network to generate images from the MNIST dataset prior to training a Denoising Autoencoder, Variational Autoencoder, and Generative Adversarial Network.

Research Experience

University of Illinois at Chicago December 2020 - June 2023

Undergraduate Research

Principal Investigator: Dr. Ying Samuel Hu

- Authored novel software in MATLAB, R, and Python for image and computational analysis of single molecule localization microscopy images.
- Utilized clustering algorithms (DBSCAN/OPTICS/Ripley's K) to determine spatiotemporal properties of single-molecule localizations.
- Published in a variety of journals including Scientific Reports, Bioconjugate Chemistry, and Biophysical Journal.
- Optimized existing numerical algorithms to decrease the time it takes for a bottlenecked lab operation by 267%.

Senior Design Project August 2023-May 2023

Mentors: Dr. Betul Bilgin and Dennis O'Brien

Project Name: "From Waste to Wonder: Bacterial Synthesis of 1,3-Propanediol from Crude Glycerol"

- Researched the chemistry of an optimized bacterial strain, *Lactobacillus reuteri CH53,* that is capable of converting crude glycerol to 1,3-propanediol.
- Developed a quantitative model for reaction kinetics and total mass flow of reactants to achieve desired products.
- Simulated the batch and fed-batch portions(bioreactors, blending vessels) of the proposed process in SuperPro simulation software.
- Simulated the continuous portion(distillation) of the proposed process in Aspen Plus process simulation software.
- Won 1st prize at the University of Illinois at Chicago Engineering Senior Design Expo within the Chemical Engineering division.

Publications

Ramseier, Neal T., Jing,H., **Anderson,J.**, et al. Superresolution Imaging Reveals the Spatial Organization of CD81 Microdomains in Regulating Membrane Signaling on Jurkat T Cell Microvilli, 8 Dec. 2024, https://doi.org/10.1101/2024.12.07.627345

Gunasekara, Hirushi, et al. “Phalloidin-paint: Enhanced quantitative nanoscale imaging of F-Actin.” Biophysical Journal, vol. 123, no. 18, Sept. 2024, pp. 3051–3064, https://doi.org/10.1016/j.bpj.2024.07.003

Saed, B., Ramseier, N., **Anderson, J.**, et al. “Increased vesicular dynamics and nanoscale clustering of IL-2 after T cell activation.” Biophysical Journal, vol. 123, no. 15, Aug. 2024, pp. 2343–2353, https://doi.org/10.1016/j.bpj.2024.03.029

Gunasekara, Hirushi, et al. Quantitative Superresolution Imaging of F-Actin in the Cell Body and Cytoskeletal Protrusions Using Phalloidin-Based Single-Molecule Labeling and Localization Microscopy, 6 Mar. 2024, https://doi.org/10.1101/2024.03.04.583337

Gunasekara, H., Perera, T., **Anderson, J**., Saed, B., Ramseier, N., Keshta, N., Hu, Y. S. (2023). Superresolution imaging with single-antibody labeling. Bioconjugate Chemistry, 34(5), 825–833. https://doi.org/10.1021/acs.bioconjchem.3c00178

Gunasekara, H., Perera,T., **Anderson,J.**, et al. “Time-lapse single-molecule imaging revealed spatiotemporal antibody interaction dynamics in situ.” Biophysical Journal, vol. 122, no. 3, Feb. 2023, https://doi.org/10.1016/j.bpj.2022.11.856

Saed, B., Munaweera, R., **Anderson, J**. et al. Rapid statistical discrimination of fluorescence images of T cell receptors on immobilizing surfaces with different coating conditions. *Sci Rep* 11, 15488 (2021). https://doi.org/10.1038/s41598-021-94730-3

Certifications & Specializations

Google Data Analytics Certificate	*Google*
Data Structures & Algorithms Specialization	*UC San Diego*
Google Project Management Certificate	*Google*
Fundamentals of Accelerated Computing with CUDA C/C++	*Nvidia*
Lean Six Sigma - Yellow Belt	*UL*