Oscar Depp

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EDUCATION

Northwestern University **Evanston, IL**

Bachelor of Science in Applied Mathematics *Expected June 2025*

- GPA: **3.98/4.00;** Dean's List All Quarters; Kellogg School of Management Certificate in Financial Economics
- Activities: Northwestern Capital Management, NU Aerospace, Club Tennis (A Team), Japanese Association (President)

Master of Science in Electrical Engineering *Expected June 2025*

- GPA: **4.00/4.00**; Tau Beta Pi Engineering Honor Society

King's Academy *(Study Abroad)* **Madaba, Jordan**

EXPERIENCE

Citigroup **NYC, NY**

Quantitative Analyst Summer Intern *June-August 2024*

- Designed a model estimating true trading volumes for capped corporate bond transactions, providing competitive quotes for clients
- Validated S&P framework assessing credit coverages in financing deals, quantifying risk characteristics in dynamic portfolios
- Simplified a capital charges model for Australian mortgages, demonstrating portfolio resilience through economic downturns
- Communicated model updates weekly to the structuring desk with a four-person team, ensuring accurate pricing for private deals

Aggelos Katsaggelos Signal Processing Lab **Evanston, IL**

Deep Learning Researcher *March 2024-Present*

- Explored theoretical & practical implications of additional sampling in deep neural networks for image processing with cultural heritage applications, with prediction times improving SOTA results in 10/12 use cases [*Work in Progress*]
- Predicted sampling times using a deep learning pipeline taking in Poisson rates and predicting dweel times for an image.
- Designed greedy adaptive sampling method for deep neural networks, minimizing count rate estimation errors while optimizing between measurement variance & Poisson KL Divergence [*Work in Progress*]
- Investigated and applied various denoising pipelines, including Gaussian and Poisson-based Total Variation (TV) losses and the Anscombe transform, to enhance signal-to-noise ratios in low-sample XRF datasets, leveraging neural networks trained on small datasets without clean targets

Vlahovska Fluids Lab **Evanston, IL**

Undergraduate Fluids Researcher *May-August 2023*

- Awarded a $4500 summer research grant for a self-directed proposal exploring electro hydrodynamics modeled by Stoke's equation
- Investigated active matter mechanisms behind swarm intelligence, self-organization, and evolution of interest rates
- Applied fast multipole method, Green's functions, asymptotic analysis, and fluids theory to simulate particle interactions in MATLAB, improving application's current simulation method
- Animated computed flow streamlines to visualize 2-D, 3-D particle behavior; presented results to mentor weekly and PI monthly

Buffett Institute of Global Affairs **Evanston, IL**

Undergraduate Researcher *September 2022-January 2023*

- Analyzed gender representation in 1000+ Arabic textbook images with pre-trained classifiers, identifying themes detrimental to DEI
- Quantified implicit bias in core class material comparing gendered word frequency & positioning plots in four 500-page textbooks
- Promoted equitable initiatives to curriculum developers addressing weak teaching methods & macro trends in the Middle East

PROJECTS

NASA 2024 Big Idea Challenge Artemis Award Winner *December 2023-November 2024*

- Received $146,420.85 in funding to develop metal inflatable technology (METALS) for the Artemis Moon Mission by 2029
- Leading METALS combustion analysis team, refining design choices facilitating large-scale deployment from stowed configurations
- Integrating computational frameworks analyzing deformation failure across various geometries, mitigating detonation risks in testing

Refugee Resettlement Assistance Model (RRAM) *October 2023-February 2024*

- Presented RRAM to State Department Refugee coordinator in the Middle East, informing refugee policy decisions on big data & ML
- Identified areas of improvement within Lebanon's informal settlements based on qualitative factors aligned with UNICEF standards
- Devised wellness scores for settlements from 12 key hygiene metrics, clustered through Gaussian Mixture Models & K-means
- Visualized settlement quality scores on an intensity-based map, prioritizing resettlement based on quality of life over proximity

SKILLS & INTERESTS

Awards: J.S. & Helen James Scholar, McCormick Summer Research Award, Segal Institute Design Award, Arabic Excellency Award
Programming: Numerical Modeling, PyTorch, Python, SQL, Git, R, MATLAB, C++, CAD, Mathematica
Languages: Fluent in English, Japanese, Chinese, Arabic
Interests: Tennis, Piano, Languages, Midnight runs, Travel, Writing Poetry & Film, Sauna Society, Beekeeping