Majdi Hassan

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Passionate about Geometric Deep Learning, Graph Networks, Generative modeling and Applications in Molecular Dynamics, Enhanced Sampling, Drug Discovery & Physics

EDUCATION

Masters of Science in Computer Science, *Mila - Quebec AI Institute, University of Montreal* **September 2023 - Present**
Bachelors of Science in Computer Engineering, *University of Illinois at Urbana-Champaign*

TECHNICAL EXPERIENCE

Associate Machine Learning Scientist II **January 2020 — September 2023**
AbbVie *North Chicago, IL*

- Conducted research on graph neural networks and ADME property prediction. As a result, SOTA internal models were developed to predict 18 ADME properties. Moreover, redesigned the existing infrastructure to be more scalable and enable autonomous continuous training of the models.
- Built end-to-end solutions that include data processing, model design, model evaluation, model deployment, and user interfacing.
- First authored internal papers on property prediction for ADME, and using computational chemistry techniques for compound similarity analysis and association discovery.
- Accelerated workflows to scientists through predictive modeling in ADME, reaction synthesis, dynamics simulation, and de novo molecule generation.
- Experience with large biomedical knowledge graph networks and building models for link prediction and graph completion.
- Lead projects in collaboration with medicinal and computational chemists in both lead developer or advisory roles.

Research Assistant **January 2021 — May 2021**
University of Texas-Austin *Remote*

- Investigated self-supervision through pre-training Graph Neural Networks towards Heterogeneous Graph Networks

Data Science Intern **September 2019 — December 2019**
AbbVie *Champaign, IL*

- Improved scalability and speed of existing data analytic pipelines
- Deployed machine learning solutions for drug property classification to aid scientists in drug selectivity

AI Developer Intern **September 2019 — December 2019**
BP *Champaign, IL*

- Utilized techniques like signal processing and pattern recognition on the data to extract features and determine when there are anomalies in the signal.
- Constructed a machine learning model that is fed data from a vibration sensor and it determines the remaining time till an anomaly occurs in order to optimize maintenance/repair operations.

Software Developer Intern **June 2019 — August 2019**
Tripp Lite *Chicago, IL*

- Built an automated integration testing framework for the device team which will ensure the integrity of the information the devices contain and the functionality of the interface they use to communicate with the devices
- Sped up integration testing while minimizing and potentially nearly eliminating any input from developers' side

Research Assistant **September 2018 — May 2019**
University of Illinois *Champaign, IL*

- Conducted research on Generative Adversarial Networks on medical image data.
- Built a CNN to detect, track, and optimize the work time of excavators and dump trucks in construction sites to analyze work efficiency of machinery.

PUBLICATIONS

TopoPool: An Adaptive Graph Pooling Layer for Extracting Molecular and Protein Substructures.
   Thieme, M., **Hassan, M.**, Rupakheti, C., Thiagarajan, K. B., Pandey, A., Liu, H.

Biomedical Knowledge Graph Refinement and Completion Using Graph Representation Learning and Top-K Similarity Measure.
   Ebeid, I.A., **Hassan, M.**, Wanyan, T., Roper, J., Seal, A., Ding, Y.