Yehya Farhat

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Education

Syracuse University *May 2023*
Master of Science in Computer Science Syracuse, NY

- GPA: 3.64 / 4.0
- Thesis: *E2E Decision-Focused Learning Using Learned Solvers*
- Graduate Chess Club President

American University of Beirut *Dec 2020*
Bachelor of Science in Computer Science, Minor in Mathematics Beirut, Lebanon

Publications & Preprints

Farhat, Yehya,
"On the Robustness of Decision-Focused Learning"
(Under Review) (2023). Artificial intelligence for Operations Research Workshop,
AAAI Conference on Artificial Intelligence (AAAI)

Research Experience

Research Intern *September 2023 – Current*
Syracuse University
Advisor: Prof. Venkata Gandikota

- Studying the expressiveness of piecewise linear functions attained by deep neural networks through the lens of linear regions. Our current work involves analyzing the number of regions attained by the learned functions, with a focus on the impact of various loss functions, optimization algorithms, and training cycles.
- Investigating efficient methods for counting the number of linear regions in deep neural networks

Research Assistant (Master's Thesis) *August 2022 – May 2023*
Syracuse University
Advisor: Prof. Ferdinando Fioretto

- Conducted a survey of End-to-End constrained optimization learning and researched an amortized method for the Decision-Focused Learning paradigm. Our framework involves developing a surrogate machine learning model for a continuous relaxation of the discrete optimization problem and substituting the learned model with the optimization solver within the pipeline.
- *"End-to-End Decision-Focused Learning Using Learned Solvers"*
  (2023). Theses - ALL. 714. https://surface.syr.edu/thesis/714

Work Experience

IT Consultant *October 2021 – May 2023*
Syracuse University College of Law Syracuse, NY

- Setup and configured proxy servers for 30+ RoomWizard devices used across the law school. New proxy server ensured smooth and uninterrupted functionality
- Imaged all new devices and connected them to university servers. Proposed and wrote automated test scripts for law school website. Updated and documented imaging policies for server migrations

Data Scientist *June 2022 – August 2022*
Qnovo Milpitas, CA

- Operated as a full-stack engineer to design and build a battery testing platform and a corresponding user interface to query the database, reduced time spent on ad-hoc reporting from 2-3 days to 10 minutes
- Cleaned and performed exploratory data analysis on 5M + rows of time-series data. Analysis was used to confirm the existence of a sensitivity problem in battery capacity estimates

Software Engineer *April 2021 – July 2021*
Precast FZCO Dubai, UAE

- Devised a cloud-based microarchitecture and employed Microsoft Azure to establish a correspondence between CMMS software and the client's IoT software, thereby streamlining task creation between software systems and reducing task creation time to zero
- Designed and implemented an integration module to connect multiple ERP, IoT, and CMMS software systems. The module included an interface allowing clients to specify what information to streamline between software systems

Teaching Experience

Introduction to Object-Oriented Design *Spring 2023*
Teaching Assistant Syracuse, NY
CSE 283 | Syracuse University

- Undergraduate course: Fundamental software design concepts of functional decomposition and object-oriented design. Taught by Prof. Farzana Rahman

Computer Organization & Programming Systems *Spring 2023*
Teaching Assistant Syracuse, NY
CIS 341 | Syracuse University

- Undergraduate course: Essentials of computer organization. digital logic, microprogramming, processors, memories, input-output devices, instruction sets. Taught by Prof. Farzana Rahman

Assured Programming and Formal Methods *Fall 2022*
Teaching Assistant Syracuse, NY
CIS 623 | Syracuse University

- Graduate-level core course: Reasoning about programs through the specification, design, and realization of provably correct programs. Taught by Prof. Andrew Lee

Advanced Computer Architecture *Spring 2022*
Teaching Assistant Syracuse, NY
CIS 655/CSE 661 | Syracuse University

- Graduate-level core course: Memory systems, pipelining, simultaneous multithreading, run-time optimization, array processing, parallel processing, multiprocessing. Taught by Prof. Ehat Ercanli

Projects

Transformers for Higher-Order Logic *May 2022*

- Collaborated with a small team to implement attention-based mechanisms for learning higher-order logic theorem proving. We implemented multiple language models and trained them on the HolStep dataset in an attempt to study automatic theorem proving; Project Link

Optimal Stopping Problem with Unknown Variable *December 2021*

- Analyzed one form of the optimal stopping problem known as the secretary problem which has a closed form solution. The equation requires the number of candidates to be known beforehand. Collaborated with a team member to attempt to find an efficient solution to the same problem but without access the number of candidates; Project Link

University Petition System *December 2020*

- Collaborated with three team members to develop a petition website for the American University of Beirut. This platform enables students to submit their petitions along with their transcripts, which are automatically parsed. The chairperson is notified if the students meet the petition requirements.
- This project enabled us to significantly streamline the process, saving the chairperson countless hours previously spent organizing and reviewing transcripts to determine if the requirements have been met;
- Technology stack: JavaScript | Node.js | React | MongoDB
  Project Link

Power Monitor *July 2020*

- Cofounded & developed power monitor, pitched to Lebanon's public government energy sector. Enable the sector to transition into digital bills and cut down on the required transportation. Saving the government thousands of dollars each month
- Allows users to track daily/monthly usage, electricity bill, and carbon footprint using the phone application; Product Website

Outreach & Extracurricular

President and Co-Founder *February 2022 – October 2022*
Syracuse University Graduate Chess Club Syracuse, NY

- Co-founded the Graduate Chess Club at Syracuse University and served as the Acting President, orchestrating the club's growth with over 150+ participants during my tenure. Successfully merged the meetings of the graduate and undergraduate chess clubs, fostering a cohesive and inclusive chess community within Syracuse University.

Math and Physics Tutor Volunteer *January 2018 – July 2019*
MMKN Beirut, Lebanon

- Served as a part-time Physics and Mathematics teacher for students in grades 9 and 10. Specifically, I conducted afternoon classes catering to refugees and members of minority communities in Lebanon.

Science Blogger *September 2023*

- **What Are the Machines Learning?**
  Farhat, Y. (2023, September 18). What Are the Machines Learning? YF's Science Journal. <https://yehya-farhat.github.io/blog/2023/MLmodels/>

Software

- Python
- C++
- C
- SQL
- R
- JavaScript
- Dart
- Julia
- Visual Studio
- XCode
- Android Studio
- Heroku
- CUDA
- HTCondor
- MongoDB
- Google Firbase
- Microsoft Azure
- Selenium
- REST API
- GraphQL
- Pytorch
- Numpy
- Keras
- Flask
- React
- Flutter

Languages

- English: Native/bilingual (TOEFL: 108/120. Date: July 05, 2023)
- Arabic: Native
- French: Basic

References

Prof. Ferdinando Fioretto
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Department of Computer Science
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Prof. Venkata Gandikota
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Dr. Dustin Summy
Lead Technology Realization Engineer
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