Andrei Rusu

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Profile

Passionate machine learning developer with a PhD in Computer Science and background in applying data science techniques to study and control epidemics. Authored a handful of publications in high-impact journals and conferences on computer modeling, reinforcement learning, and graph neural networks. Experienced in several data frameworks and tools, including Pandas, PyTorch, NetworkX, and LangChain. Demonstrated capabilities in software engineering and stakeholder management both in academia and industry. Excellent collaboration skills, with a track record of working effectively in multidisciplinary teams. Eager to join innovative AI initiatives.

Experience

University of Southampton, PhD in Computer Science and Student Ambassador   Southampton, UK
Sept. 2019 to Feb. 2024

- Analyzed the dynamics of epidemics via network-based models, publishing two journal studies and an award-winning conference paper. Thesis: Inquiry into diffusion processes over interaction networks ↗.
- Used graph neural networks and reinforcement learning to derive highly effective and explainable policies for testing, tracing, and vaccination in viral epidemics.
- Mentored, supervised, and demonstrated labs for pupils, undergraduate and postgraduate students on several topics, including deep learning, data science, software engineering, and University life.

Continental Automotive, Software Developer   Iasi, Romania
July 2018 to Sept. 2018

- Took part in a successful company-wide research project aimed at comparing the four major cloud providers in terms of their natural language understanding engines.
- Built an Android chatbot system with Google Dialogflow and text-to-speech integration, capable of answering queries about weather, traffic, location, places, and others.

J.P. Morgan Chase & Co., Technology Analyst, Intern   London, UK
June 2017 to June 2018

- Interacted on a daily basis with middle-office and traders to implement and maintain dependable trading risk management tools, improving both efficiency and profits.
- Acquired a clear understanding of OOP design and Agile workflows by developing features for Kapital, a critical system for the bank with hundreds of users.

Akixi Ltd., Web and Java Developer, Intern   Crawley, UK
June 2016 to Sept. 2016

- Developed a utility for on-demand compilation of JSP files, offering our users the option to generate personalized PDF documentation faithful to our help portals.
- Created a web portal for testing Java Servlet applications that became widely used in the company.

Education

BSc University of Southampton, Computer Science   Sept. 2015 to July 2019

- First Class Honours with average grade of 84% (1st year), 84.75% (2nd year), and 85.5% (3rd year)
- Achieved the Netcraft Ltd. prize for ranking in the top 10 of my class according to marks.
- **Coursework:** Machine Learning, Data Mining, Computer Vision, Intelligent Systems, Advanced Databases, Computational Finance, Individual Project: Using VAEs for sharper image generation ↗.

Publications

EpiCURB: Learning to derive epidemic control policies   Oct. 2023
A. C. Rusu, K. Farrahi, M. Niranjan
10.1109/MPRV.2023.3329546 ↗ (IEEE Pervasive Computing - In Press ↗)

Flattening the curve through reinforcement learning driven test and trace policies   Dec. 2022
A. C. Rusu, K. Farrahi, M. Niranjan
10.1007/978-3-031-34586-9_14 ↗ (EAI PervasiveHealth 2022)

Modelling digital and manual contact tracing. Are low uptakes and missed contacts deal-breakers? Oct. 2021

A. C. Rusu, R. Emonet, K. Farrahi

10.1371/journal.pone.0259969 ☒ (PLOS One)

Recent Projects

LLM chatbots July 2018 to Jan. 2024

- Developed several LLM applications for chatting with documents and searching the web for information.
- Used Python (LangChain, Streamlit), Java (Android), and JavaScript (Google Dialogflow). More details ☒, ☒.

Agents for controlling diffusion processes Dec. 2021 to June 2023

- Developed several agents that can rank nodes in a graph for directing public health interventions.
- Used Python (PyTorch, PyTorch Lightning, scikit-learn), Bash scripting, and SLURM. More details ☒.

IBMF epidemic simulator Sept. 2020 to Nov. 2021

- Developed a network-based simulator for diffusion processes that is highly customizable and can be used to model and visualize the spread of complex pathogens such as SARS-CoV-2.
- Used Python (NetworkX, Pandas), Bash scripting, and SLURM. More details ☒.

Additional Experience And Awards

Best Paper Award at EAI PervasiveHealth (2022): Awarded for the paper "Flattening the curve through reinforcement learning driven test and trace policies".

3rd place at the Continental Hackathon Bug Hunt (2018): Traced and fixed several bugs in the company's navigation platform.

Bloomberg Market Concepts (2018): Acquired knowledge of financial markets and instruments through completing the BMC course.

2nd place at the J.P. Morgan Intern Hackathon (2017): Developed a PHP application for a charity organization in 48 hours.

Marketing Executive (2016 - 2017): In charge of the marketing strategy and digital content of HackaSoton, student society responsible for the annual hackathon at the University of Southampton.

Chess National Champion (2006): Creative thinking developed through playing chess competitively. Won the 2006 single and team national championships in my age category in Romania. Former president of the chess club at the University of Southampton.

Technologies

Languages: Python, Java, MATLAB, JavaScript, C/C++, Smalltalk, Bash, SQL.

Software: Jupyter, VS Code, Eclipse, Android Studio, PyCharm, Code::Blocks, Pharo.