Andrei Rusu

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Experience

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

- Published two journal studies and an award-winning conference paper on data-driven epidemic modeling and control. Thesis: An inquiry into diffusion processes over interaction networks ↗.
- Designed an efficient graph neural network architecture and a reinforcement learning pipeline to derive highly effective and explainable policies for testing, tracing, and vaccination in epidemics, increasing their simulated impact by margins of up to 50% when compared to standard strategies.
- Authored a research report on the potential of language models to be used in conjunction with system biology models to detect neoantigenic peptides for developing cancer vaccines.
- Mentored, supervised, and demonstrated labs for pupils, undergraduate and postgraduate students on several topics, including deep learning, data science and software engineering.

Continental Automotive, Software Developer, Intern   Iasi, Romania
   Jul. 2018 to Sep. 2018

- Contributed to a successful interdepartmental research project aimed at comparing the four major cloud providers in terms of their natural language understanding engines.
- Built an Android chatbot for drivers with Google Dialogflow and text-to-speech integration, capable of answering queries about the traffic, location or weather at 20% of the cost of other providers.

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

- Worked alongside middle-office and traders to implement and maintain dependable risk management tools, some of which lead to 25% improvements in the reporting time.
- Acquired a clear understanding of OOP design and Agile workflows by developing features for the Kapital platform, a critical risk management system with hundreds of users.

Akixi Ltd., Web and Java Developer, Intern   Crawley, UK
   Jun. 2016 to Sep. 2016

- Developed a utility for on-demand compilation of JSP files, offering our users the option to generate personalized PDF documentation based on the help pages of our call reporting application.
- Created a platform for testing Java Servlet services that became widely used in the company, reducing the time spent on manual testing environment configuration by more than 30%.

Education

University of Southampton, BSc in Computer Science with Industrial Studies   Sep. 2015 to Jul. 2019

- First Class Honours with the average grades 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 cohort according to marks.
- Individual Project: Exploring VAEs in the context of 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)

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 applications   Jan. 2024
- Developed several chatbot applications for retrieving information from documents and the web.
- Used Python (LangChain, Streamlit), Java (Android), JavaScript (Google Cloud). Details ⬀, ⬀.

Agents for controlling diffusion processes   Jun. 2023
- Engineered several agents that can rank nodes in a graph for directing public health interventions.
- Used Python (PyTorch, PyTorch Lightning, scikit-learn), Bash scripting, SLURM. Details ⬀.

IBMF epidemic simulator   Nov. 2021
- Implemented 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 (Pandas, NetworkX, PyMC), Bash scripting, SLURM. Details ⬀.

Additional Experience And Awards

Complete Guide to Power BI for Data Analysts by Microsoft Press (2024): Received certificate for completing the Power BI course.

Best Paper Award at EAI PervasiveHealth (2022): Awarded for our contribution to reinforcement learning and epidemic control.

Bloomberg Market Concepts (2018): Received certificate for finishing the BMC course, which covers topics in financial markets.

3rd place at the Continental Hackathon Bug Hunt (2018): Traced and fixed data-retrieving bugs in a TomTom navigation platform.

2nd place at the J.P. Morgan Intern Hackathon (2017): Developed a data-centric PHP application for a charity organization.

Marketing Executive (2016 - 2017): Responsible for the marketing strategy and the digital content of HackaSoton, a student society that organizes the annual hackathons at the University of Southampton.

Technologies

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

Software: VS Code, Jupyter, Azure Machine Learning, Google Dialogflow, Docker, Android Studio, Microsoft 365 (incl. Power BI).

Databases: MySQL, PostgreSQL, Azure Cosmos DB, MongoDB, Qdrant.