Gavin Rolls

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EDUCATION

[Incoming] Northeastern University London — October 2024 - Present
Ph.D. Network Science

- Incoming PhD Student in the Complex Connections Lab at Northeastern University, London
- **Subject Areas:** Complex Systems, City Science, Computational Social Science, Network Science, Data Science, Physics
- **Supervisors:** Dr. Riccardo Di Clemente, Dr. Esteban Moro

University College London — September 2023 - September 2024
MSc. Urban Spatial Science — *Current Grade: Distinction*

- Student in the Bartlett Centre for Advanced Spatial Analysis
- **Notable Coursework:** Remote Sensing, GIS, Spatial Applications with Big Data, Urban Modelling and Simulation, Quantitative Methods for Spatial Data Science, Urban Systems Theory
- **Thesis:** Predicting Micro-Scale Employment Geographies with Points of Interest

Georgia Institute of Technology — August 2019 - May 2023
B.S. Computer Science — *GPA: 3.91 (First Class Honours) / Major GPA: 4.0*

- Graduated Highest Honours with Concentrations in Human Computer Interaction and Information Internetworks
- **Awards:** Stamps President's Scholar – Georgia Tech's premier full-ride merit scholarship. 40 selected from 20,000 applicants. Selected based on the pillars of scholarship, leadership, progress, and service
- **Notable Coursework:** Database Systems, Computer Architecture, Computer Networking, Computer Org. & Programming, Design & Analysis of Algorithms, Statistics & Applications, Applied Combinatorics, Info Visualisation

SKILLS

Spatial Science:

- Experience in spatial analysis with Python (SciPy, NumPy, Matplotlib, Pandas, GeoPandas, scikit-learn, AutoML), R (tidyverse, sp, sf, ggplot2, terra, spatstat), QGIS, Google Earth Engine, (Spatial) SQL, Javascript (D3.js)

General Computing:

- Python, R, Java, JavaScript, HTML, CSS, Typescript, Angular, SQL, Cypress, React Native, Excel, C, C++, MATLAB

Development & Presentation Tools:

- GitHub, Git, IntelliJ, Jira, Confluence, Bitbucket, Agile Development, Jupyter, Jenkins, Quarto, LaTeX

Speaking & Presentation:

- Extensive experience in extemporaneous speaking and debate – Member of Outstanding Distinction of the U.S. National Debate Association, 1st ranked Lincoln-Douglas debater in Colorado
- Led Agile development team of 6 as Scrum Master
- Lectured as teaching leader (GT 1801) and assistant lecturer (INTA 3232)

Work Experience

Georgia Tech Japan Program in Sustainable Development May 2023
Assistant Lecturer and Module Leader *Kobe, Japan*
- Delivered lectures on geospatial analysis and remote sensing for urban boundary delineation in *INTA 3232 – Smart & Sustainable Megaregion*. Taught 25 students from multiple U.S. universities at Kobe University
- Created lecture material to teach the fundamentals of geospatial analysis in QGIS and Earth Engine with a focus on the VIIRS sensor platform and non-remotely sensed raster datasets, and conducted GIS exercises to apply taught skills

Sustainable Megaregions Research Project February 2021 - May 2023
Undergraduate Research Assistant *Atlanta, Georgia*
- Delineated boundaries of established and emerging megaregions using NASA VIIRS and DMSP datasets in Google Earth Engine
- Designed and coded a data-first megaregions delineation tool with Earth Engine. Used the approach to perform a global search
- Analyzed and aggregated 400+ papers as part of a comprehensive literature review of megaregion literature

MessageGears May 2022 - August 2022
Software Engineering Intern *Atlanta, Georgia*
- Worked as a full stack developer on MessageGears' email marketing web app
- Created and implemented novel user interface elements using TypeScript and Angular and Improved application interface with SQL backend using REST API calls
- Wrote unit tests, view tests, and Cypress tests to improve testing coverage across the testing stack

Paul Easton Basketball May 2020 - August 2020
Frontend Developer *Denver, Colorado*
- Used React Native/React Navigation to design and build a cross-platform mobile app for Basketball trainers to upload and review customer footage

Projects

Simulating the London Underground February 2024 - April 2024
Sole creator
- Wrote a paper modelling the London Underground which used a modified version of Dijkstra's shortest path algorithm and origin/destination data from Transport for London to estimate commuter flows on each link and identify the most important stations on the system. Paper (with GitHub link) Hosted at https://gavinrolls.com/londonunderground.html

Crowd-sourcing Career Development February 2022 - March 2022
Co-creator
- Wrote a qualitative, human-subjects research paper investigating participants from the Reddit community r/CSCareerQuestions
- Investigated how design choices have shaped the community and the different participant archetypes it attracts and how community membership evolves through the legitimate peripheral participation (LPP) framework

Visualising Mass Shootings in the U.S. November 2021
Co-creator
- Created an interactive graphic of injuries and casualties from mass shootings in the U.S. using D3.js. Hosted at https://gavinrolls.com/MassShootings/shootings.html

Chess Engine May 2021 - July 2021
Sole creator
- Created a chess engine and game visualization with Java. Selected moves with an alpha-beta pruning minimax search algorithm

Publications

Co-Author - Woodall et al. (2023) The Megaregion – Forms, Functions, and Potential? A Literature Review and Proposal for Advancing Research. *International Journal of Urban Sciences* 28:1, pp. 82-104. https://doi.org/10.1080/12265934.2023.2189156

(Pending Review) Co-Author - Challenges in Using Satellite Data for Social Science, An Exploratory Case Study

Extracurriculars

Georgia Tech Tour Guide   January 2021 - May 2023
Lead Guide   *Atlanta, Georgia*
- Assisted prospective students and families in their college process by providing campus tours as an ambassador to the Institute
- Fall 2022 Tour Guide of the semester – selected to model tour procedure to new guides

Georgia Tech Transport & Infrastructure Committee   August 2020 - May 2023
Member   *Atlanta, Georgia*
- Advanced student interests in transportation by lobbying for improved bus service and cycling accessibility on campus

Stamp's Scholars - Special Topics   August 2021 - December 2021
Teaching Leader   *Atlanta, Georgia*
- Assistant instructor for GT 1801, an orientation course for first year President's Scholars at Georgia Tech

Personal Sport   2015 - Present
Amateur Ultra-Distance Cyclist, Runner, & Triathlete
- Passionate amateur endurance athlete - completed self supported ultra-marathons and ultra-cycling events
- Participated in the 2022 Ironman Triathlon World Championships (3.8km swim, 180km bike, 42.2km run), U.S. Collegiate Triathlon National Championships, and UK Collegiate Duathlon National Championships
- Cycled 4,500km from Naples, IT to Edinburgh, UK (excluding English Channel) to cross Europe by bicycle