

Gavin Rolls

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EDUCATION

Northeastern University London

October 2024 - Present

Ph.D. Network Science

- PhD Student in the Complex Connections Lab at the Network Science Institute, Northeastern University London
- **Subject Areas:** Complex Systems, Network Science, Urban Dynamics, Urban Morphology, Inequality and Segregation, Data Science, Physics
- **Supervisors:** Dr. Riccardo Di Clemente, Dr. Marek Grzes (Univ. Kent), Dr. Esteban Moro (Northeastern Univ.)

University College London

September 2023 - September 2024

MSc. Urban Spatial Science

Mark: Distinction (71.84%)

- 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 (Thesis Mark: Distinction)

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, osmnx), 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, Snowflake, Cypress, React Native, Excel, C, C++, MATLAB

Development & Presentation Tools:

- GitHub, Git, IntelliJ, Jira, Confluence, Bitbucket, Agile Development, Jupyter, Jenkins, Quarto, L^AT_EX

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 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 Publication) Co-Author - Challenges in Using Satellite Data for Non-Remote Sensing Specialists, 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