

# Jack Edward Geng-Gene Hayes

Email: [jehayes@uw.edu](mailto:jehayes@uw.edu)

Phone: (571) 295-6082

GitHub: [https://github.com/Jack-Hayes/grad\\_samples](https://github.com/Jack-Hayes/grad_samples).

416 Summit Ave E Apt 204

Seattle, WA 98102

---

## EDUCATION

### University of Washington - Seattle, WA

**Expected Graduation: June 2029**

PhD in Civil and Environmental Engineering (Data Science Option)

Incoming Autumn 2024

### William & Mary - Williamsburg, VA

**Graduated May 2024**

B.S. in Data Science, Spatial Data Analytics

Magna Cum Laude

Relevant Coursework: Databases, Statistical Data Analysis, Probability and Statistics for Scientists, Advanced GIS, Applied Machine Learning, Data Visualization, Linear Algebra, Remote Sensing

**International Education Program:** Participated in Institute for Educational Studies (IES) Study Abroad Program in Cape Town, South Africa (Summer 2022)

---

## ACADEMIC ASSISTANTSHIPS and FELLOWSHIPS

### National Science Foundation REU Fellow - Harvard University

JULY 2023 - DECEMBER 2023 | Remote

- Worked as a fellow at the National Science Foundation's Spatiotemporal Innovation Center under Harvard's Center for Geographic Analysis conducting research to advance NSF grant projects alongside graduate students, postdocs, faculty, and staff across various spatiotemporal domains (CS, GIS, Geosciences, Social Sciences, etc.)
- Compiled, transferred, and analyzed big data across HPC and cloud environments such as the New England Research Cloud (NERC)
- Prepared documentation and training manuals for HPC and cloud software usage
- Conducted literature reviews and contributed to journal publication processes and open source data repositories

### Student Research Assistant - Key Biodiversity Areas

SEPTEMBER 2022 - PRESENT | Cambridge, England (Remote)

- Utilized high performance computing clusters for scripting in Python and R
- Prepared and analyzed big geospatial data for the International Union for the Conservation of Nature
- Conducted a literature review used in two journal papers
- Collaborates with UK-based Key Biodiversity Areas Secretariat and Executive Director of the Institute for Integrative Conservation

### International Research Assistant - Nepal Engineering College

DECEMBER 2022 - DECEMBER 2023 | Kathmandu, Nepal and Williamsburg, VA

- Led GPS field work with PIs, engineers, and graduate students from the Nepal Engineering College, W&M, and the Virginia Institute of Marine Science
- Documented and mapped local ecological knowledge across Nepal's watersheds
- Conducted surveys and questionnaires, focus group discussions, key informant interviews, and participatory mapping sessions in Nepal

### Student Research Assistant - W&M Center for Geospatial Analysis

SEPTEMBER 2022 - PRESENT | Williamsburg, VA

- Supported development of an areal segregation unit measure used for legislative redistricting assessment
- Operated high performance computing clusters for nationwide vector analysis
- Coordinates with GIS professionals and faculty to maintain cross-departmental communication

### Teaching Assistant - W&M University

SEPTEMBER 2022 - PRESENT | Williamsburg, VA

- Applied Machine Learning: Data Science 311
- Introduction to GIS: W&M Center for Geospatial Analysis
- Introduction to Tonal Theory: Music 201
- Introduction to Conservation GIS: Conservation 210
- Introduction to Data Science: Data Science 201

### Machine Learning Student Researcher - W&M Data Science

MAY 2022 - PRESENT | Williamsburg, VA

- Analyzed and developed time series analysis algorithms, advanced convolutional neural network architectures, and probabilistic measures of uncertainty
- LSTM RNNs, DenseNet CNNs, entropy

## JOURNAL PUBLICATIONS

---

Plumtree, A., **J.E.G. Hayes**, Baisero, D., Rose, R., R.J. Smith, "The benefits and constraints of Systematic Conservation Planning and Key Biodiversity Areas approaches to spatial planning"

*Conservation Biology: Conservation Practice and policy*, Submitted 02/09/2024

Baisero, D., **J.E.G. Hayes**, Plumtree, A., Rose, R., "The Significance of Gamma Irreplaceability in Combating Random Site Loss for Spatial Conservation Planning" *Conservation Letters*, In progress

Fu, Xiaokang, Devika, J., **J.E.G. Hayes**, "Enriching Big Geospatial Data: A case study of enriching 10 Billion tweets with Geography", *Transactions in GIS*, Submitted 01/28/2024

Blossom, Jeff., Devika, J., **J.E.G. Hayes**, "Building RINX: A Containerized Raster Information Extraction System on OpenShift Cloud Environment", *Cartography and Geographic Information Science*, Submitted 02/02/2024

Iaci, R., Vasiliu, D., **J.E.G. Hayes**, "Increasing the Predictive Power of a Casino Player Tracking Dataset in Forecasting Player Redemption of Promotional Offers", In progress

Fu, Xiaokang, Devika, J., **J.E.G. Hayes**, "A Cloud-Based Architecture for Improving Drive Time Estimations on Big Geospatial Data", In progress

## GRANT INVOLVEMENT

---

- NASA Advanced information systems to fill STV gaps: next-generation stereo+lidar fusion and sensor technology  
Grant Length: AUGUST 2024 - PRESENT  
Total Awarded Amount to Date: \$293,000.00  
Years Involved: 2024
- NSF Phase II I/UCRC Harvard: Center for Spatiotemporal Thinking, Computing and Applications (STCA)  
Grant Length: MARCH 2019 - APRIL 2024  
Total Awarded Amount to Date: \$596,000.00  
Years Involved: 2023-2024

## ADDITIONAL COURSES and PROGRAMS

---

### NASA Earth Sciences & UW Hackweek 2024

AUGUST 2024 | Seattle, WA

- Tutorials + peer-to-peer learning + project based teamwork using NASA's ICESat-2 data.

## COMPUTATIONAL PROFICIENCIES

---

- Programming: Python, R, SQL, Linux
- Libraries: Pandas, PyTorch, TensorFlow, Keras, Scikit-Learn, Geopandas
- Advanced computational ecosystems: High Performance Computing (HPCs), Cloud Environments
- Esri software products: ArcGIS Pro, AGOL, StoryMaps, Dashboards, Experience Builder, Model Builder
- Open source involvement: [OpenDP](#), [Harvard Dataverse](#)
- Miscellaneous familiarities: Google Earth Engine, HTML, CSS, JavaScript, Tableau, GitHub, Bitbucket, PostgreSQL, Docker, Kubernetes
- [Code samples \(https://github.com/Jack-Hayes/grad\\_samples#readme\)](https://github.com/Jack-Hayes/grad_samples#readme)

## PROFESSIONAL DEVELOPMENT

---

### Data Scientist - Harvard Center for Geographic Analysis

JANUARY 2024 - JUNE 2024 | Remote

### Intern - Harvard Center for Astrophysics

JANUARY 2024 - APRIL 2024 | Remote

### Co President - W&M TEDx

SEPTEMBER 2021 - PRESENT | Williamsburg, VA

## **Extern - W&M Information Technology**

JANUARY 2023 | Williamsburg, VA

## **Technical Consultant Extern - UNISON Global**

JANUARY 2023 | Remote

## **App Developer - Thrillsburg App Co.**

OCTOBER 2022 - OCTOBER 2023 | Williamsburg, VA

## **Time Management Consultant and Tutor - W&M Tutor Zone**

SEPTEMBER 2022 - JULY 2023 | Williamsburg, VA

## **PROFESSIONAL MEMBERSHIPS**

---

American Geophysical Union (AGU) - Member

JULY 2023 - APRIL 2024

Virginia Association for Mapping and Land Information Systems (VAMLIS) - Member SEPTEMBER 2023 - PRESENT

## **CONFERENCE PROCEEDINGS AND PRESENTATIONS**

---

The Symposium on Spatiotemporal Data Science 2024

Arlington, VA

- **J.E.G. Hayes**, Fu, Xiaokang, Devika, J., “Developing Open-access datasets from private Big Data Repositories: Challenges and Opportunities”, Oral Presentation, 07/24/2024

AGU Fall Meeting 2023

San Francisco, CA

- **J.E.G. Hayes**, Baca, J., Lohani, S., Dongol, R., Regmi, S., Paudel, R., “Documenting and Mapping Local Ecological Knowledge and Practices around Watersheds to Inform Community-Based Sustainability and Conservation Policy in Nepal”, Oral Presentation, 12/12/20223

Sci-Fri Fall Symposium 2023

Williamsburg, VA

- **J.E.G. Hayes**, Vasiliu, D., “Densely Connected Convolutional Neural Network Architecture in Continuous Gravitational Wave Detection”, Poster presentation, 09/22/2023