Jack Edward Geng-Gene Hayes

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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

Major GPA: 3.95

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

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

Plumptree, 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**, Plumptree, 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

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

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)

PROFESSIONAL DEVELOPMENT

Data Scientist - Harvard Center for Geographic Analysis
JANUARY 2024 - PRESENT |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
- **J.E.G. Hayes**, Fu, Xiaokang, Devika, J., "Developing Open-access datasets from private Big Data Repositories: Challenges and Opportunities", Accepted 04/26/2024

CaGIS + UCGIS 2024
- Blossom, Jeff., Devika, J., **J.E.G. Hayes**, "Building RINX: A Containerized Raster Information Extraction System on OpenShift Cloud Environment", Submitted 02/02/2024

ESRI UC 2024
- Fu, Xiaokang, Devika, J., **J.E.G. Hayes**, "Enriching Big Geospatial Data: A case study of enriching 10 Billion tweets with Geography", Accepted 12/19/2023

AGU Fall Meeting 2023
- **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 (W&M Events)
- **J.E.G. Hayes**, Vasiliu, D., "Densely Connected Convolutional Neural Network Architecture in Continuous Gravitational Wave Detection", Poster presentation, 09/22/2023