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HEIDI M HURST

SUMMARY

ACADEMIC EXCELLENCE

Graduated Cum Laude from Harvard University with BA in Applied Mathematics; received multiple awards for excellence in GIS at Harvard University and UCL.

Currently enrolled in MSc Mathematical Modeling and Scientific Computing at Oxford University. Recently completed MSc GIS at UCL.

TECHNICAL EXPERIENCE

Developed and evaluated Python algorithms for use across emergency management, intelligence, and defense sectors.

Independent research on deep learning techniques for object recognition in satellite imagery as part of MSc GIS dissertation at UCL.

Experience as software developer building, testing, and deploying custom cloud-based software solutions for US Government Agency clients as part of multi-disciplinary teams.

EDUCATION

OXFORD UNIVERSITY

October 2018 - September 2019 (est)

MSC MATHEMATICAL MODELLING AND SCIENTIFIC COMPUTING

Taught MSc course in the Oxford Mathematical Institute focusing on mathematical formulation, numerical methods, and interpretation of real-world problems and solutions.

UNIV COLLEGE LONDON

October 2017 - September 2018

MSC GEOGRAPHIC INFORMATION SCIENCE (GIS)

Taught MSc course. Firm grounding fundamentals of geographic information science theory and implementation, including practice with real-world data and extensive scripting in R and Python. Awarded most promising Geomatics student at UCL.

Dissertation: *Impact of Resolution on Satellite Imagery Object Detection using Neural Networks* - research on vehicle detection in varying resolution satellite images using xView object detection dataset and deep learning SSD architecture.

Coursework includes:

Image Understanding - practical, theoretical grounding in (satellite) imagery analysis
Spatio-temporal Data Mining - prediction & value extraction from large datasets (R)
GIS Principles & Technology - scripting in Python for geospatial tool development
Databases & Data Management - including SQL, NoSQL, Postgres, PostGIS work
Structures & Algorithms, Spatial Analysis, Network & Locational Analysis, …

HARVARD UNIVERSITY

September 2011 - May 2016

BA APPLIED MATHEMATICS, FOCUS IN NAVIGATION AND GEOSPATIAL ANALYSIS

Cum Laude in Field *Overall GPA: 3.736/4.0*

BA degree in Applied Mathematics, focused on proof-based learning and algorithm implementation with optional modules in navigation and geospatial analysis.

Coursework included:

Graph Theory & Combinatorics, Applied Linear Algebra & Big Data (Matlab), Differential Equations, Optimization (AMPL), Statistics, Advanced GIS (Python), …

WORK EXPERIENCE

BOOZ ALLEN HAMILTON

August 2016 - August 2017

SOFTWARE ENGINEER + CONSULTANT

Developed algorithms and custom state-of-the-art software using open source and commercial packages in Java, JavaScript, Docker, Node, HTML for deployment in AWS cloud environment for US Government Agency client using Scaled Agile Framework.

Lead developer on internal proof-of-concept project to extract information from satellite imagery using open source tools (Python, GRASS, GDAL, QGIS).

As part of multi-disciplinary teams, supported US Government clients to develop high budget technical programs by running data analyses and creating briefings. Experience balancing multiple projects concurrently and interacting directly with clients.

FEMA — **DHS-STEM ANALYST (INTERN)**

June 2015 - August 2015

Created award-winning algorithm in Python to determine suitability of potential Disaster Recovery Center locations using geospatial metrics and feedback from program managers in the field. Elements of method incorporated into standard suite of Federal Emergency Management Agency cartographic products.
Spoke to FEMA employees and partner agencies at ESRI User Conference, Region 1 FEMACorps Teams, and FEMA Analytics working group to share methods and results.

HARVARD MATH DEPT — **COURSE ASSISTANT (MULTIVARIABLE CALCULUS & LINEAR ALGEBRA)**

January 2014 - May 2014

Taught weekly section of *Math 23b: Multivariable Calc & Linear Algebra* to 10 students.

Engaged students in weekly help sessions and facilitated "proof parties" to increase comfort with rigorous proof-based mathematics.

AWARDS

July 2018 UCL Hotine Exhibition Prize for Best Performance in Geomatic Engineering Programmes
July 2017 Booz Allen Hamilton Collective Ingenuity Award
April 2016 Harvard Howard T. Fisher Prize For Excellence in GIS
March 2016 Harvard ESRI Development Center Student of the Year Award

CONFERENCES ATTENDED

March 2018 Free & Open Source Software for Geospatial (FOSS4G) London
November 2016 Search and Rescue GIS 8 Conference
July 2016 NIH NIEHS Disaster Research Response Workshop
June 2016 ESRI User Conference
April 2016 Harvard Center for Geographic Analysis Conference
June 2015 Geospatial Intelligence (GEOINT) Symposium

TALKS, POSTERS, AND ARTICLES

ESRI USER CONFERENCE — **FEMA SPECIAL INTEREST GROUP MEETING SESSION: ARE WE ASKING THE RIGHT QUESTIONS?**

28 June 2016

Discussed past success in Disaster Recovery Center allocation research as case study for using GIS and spatial algorithms to drive creative and proactive planning processes.

Addressed FEMA Special Interest Group including FEMA Chief Information Officer, FEMA National Geospatial Coordinator, state and regional partners.

HARVARD UNIVERSITY — **CENTER FOR GEOGRAPHIC ANALYSIS ABCD GIS SEMINAR: CODING EFFICIENT DISASTER RECOVERY**

21 April 2016

Explored advantage of using Python-based algorithms and scripting techniques to automate products and expedite decision making in disaster scenarios. Advocated pre-planning and custom ArcPy scripts.

Addressed members of the Harvard GIS Community, including founding members of Harvard Center for Geographic Analysis.

GIRL'S ANGLE BULLETIN — **MATH IN YOUR WORLD: MATH TO THE RESCUE**

April/May and June/July 2016

Paid contributor to Girl's Angle Bulletin, an online publication aimed at encouraging an interest in math and science among girls grades 5-12.

Explained research on allocation of FEMA Disaster Recovery Centers for non-technical audience to inspire interest in STEM careers and applications.

VOLUNTEERING

SHENANDOAH MTN RESCUE GROUP — **PRE-CALLOUT QUALIFIED MEMBER**

September 2016 - August 2017

Practice deployments of GIS technology, dispatch responsibilities for urban and wilderness search and rescue missions.

Participate in trainings on evacuation procedures, land navigation, search skills, etc.