CHRISTOPHER R. HABERLAND

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EDUCATION

UNIVERSITY OF WASHINGTON — **SEATTLE, WA**
Master of Science: Computational Linguistics — **2016 – 2019**

- GPA – 3.97
- Notable courses: Advanced Statistical Methods for Natural Language Processing, Syntax for Computational Linguists, Deep Processing Techniques for Natural Language Processing
- Arabic FLAS Fellow, Middle East Center – 2017-18 Academic Year

UNIVERSITY OF VIRGINIA — **CHARLOTTESVILLE, VA**
Master of Public Policy — **2013 – 2015**
Concentration: Environmental Policy
Advisor: Randall Lutter

- GPA – 3.67
- Notable courses: Statistical Machine Learning, Computation for Research, Economics of Public Policy
- Applied Policy Project (Thesis): *Compliance with the EPA's Clean Power Plan: Virginia's Challenges*

UNIVERSITY OF VIRGINIA — **CHARLOTTESVILLE, VA**
Bachelor of Arts: Double Major in Spanish and Middle Eastern Languages and Literatures — **2009 – 2013**
Minor: Economics

- GPA – 3.77 ~ Phi Beta Kappa
- Dean's List – 7/8 semesters
- Notable courses: Intro to Econometrics, Environmental Economics

HERNDON HIGH SCHOOL — **HERNDON, VA**
High School Diploma — **2005 – 2009**

- GPA – 4.31

PROFESSIONAL EXPERIENCE

Mosaix.ai — **PALO ALTO, CA**
Natural Language Processing Engineer — **September 2018 – present**
Supervisor: Ni Lao
Email: ni.lao@mosaix.ai
Ask before contacting
40 hrs/week

Architect custom data collection and information transfer system for semantic search and digital personal assistant startup. Design NoSQL/MongoDB databases to store millions of complex JSON documents and audio files that scale efficiently with company growth. Create enforceable database schemas to support data standardization and interoperability between multiple product components. Design client-facing UX system to allow for data collection for training machine learning models. Communicate with company clients and internal users to incorporate desired product requirements. Manage UX designers and subordinate engineers to complete database and product design projects on schedule. Design and manage systems for understanding company data using statistical methods and creating distributable graphical user interfaces (GUIs) for data analysis to support non-technical staff. Design and maintain ontological system for multilingual voice assistant and semantic search application. Introduce components to natural language understanding pipeline and conduct experiments with various machine learning models to improve domain and intent classification and entity parsing for several languages, including English, Arabic, Hindi, and Vietnamese. Design and carry out data collection projects with

custom-built labeling tools to support natural language understanding model training. Manage group of data annotators and language experts to ensure data quality. Train neural network models to create Arabic automatic speech recognition functionality to support vocal queries.

Department of Linguistics, University of Washington **SEATTLE, WA**
Researcher **September 2018 – August 2019**
Project Lead: Gina Levow
10 hrs/week

Plan and develop optical character recognition pipeline for the DARPA-funded LORELEI project. Extract multilingual data from printed materials for language modeling of low-resource languages using Tesseract OCR, fastText, and other open source software.

eScience Institute, University of Washington **SEATTLE, WA**
Data Science for Social Good Fellow **June 2018 – August 2018**
Project Lead: Youngjun Choe, (206) 221-8908
Email: ychoe@uw.edu
May contact
40 hrs/week

Selected for competitive fellowship to create a model to automatically identify post-hurricane damages from remotely-sensed images by implementing a single-shot multi-box detector algorithm with Tensorflow. Tune hyper-parameters of neural network models to improve mean average precision of spatial detection on development data sets. Serve as data engineer for defining and cataloging training data.

University of Washington **SEATTLE, WA**
Researcher (contract) **March 2018 – June 2019**
Supervisor: Spencer Wood, (206) 697-0484
Email: spwood@uw.edu
May contact
20 hrs/week

Forest Service ChatBot for Conversational Data Solicitation from National Forest Visitors
Work with Forest Service land manager and university researchers to build technical framework for deploying an SMS digital chatbot that converses with visitors to National Forests to distribute information and collect data of interest. U

Topic Modeling and Classification of TripAdvisor Reports
Developed custom ontological tagging schema and annotation program to create gold-label training data of social media documents from tripadvisor.com. Trained and evaluated skip-gram, cbow, SVM, logistic regression, and random forest models for classification of tripadvisor.com text data that evinces economic activity dependent upon coral reefs. Document methods and model results for future implementation of tagging and classification pipeline.

U.S. Department of State **CHARLOTTESVILLE, VA**
Virtual Intern **October 2016 – August 2017**
Supervisor: Matt Chessen, (202) 368-3602
Email: chessenmb@fan.gov
May contact
10 hrs/week

Develop "ConSoul" Chatbot

Managed a team of junior developers to design chatbot that answers questions about foreign countries and their bilateral relations with the United States. Implemented a combination of platforms and tools, including Heroku, api.ai, Python, and MongoDB. Using api.ai, developed natural language entities and intents to build machine logic to converse with users.

U.S. Forest Service **WASHINGTON, D.C.**
Fellow, Natural Resource Economics **October 2015 – August 2017**
Supervisors: Luanne Lohr, (703) 605-4824
Email: luannelohr@fs.fed.us
May contact
40 hrs/week

Create Geospatial Applications Analyzing Economic Tradeoffs across Landscapes
Consult with Forest Planners, scientists, social scientists, and other stakeholders to create web-based GIS applications that facilitate the geospatial identification of economic values of resources on Forest Service lands. Gather and analyze data of open source and government origin to characterize the temporal and spatial aspects of socioeconomic factors, carbon sequestration, water, timber, recreation, and disease, fire, and flood risk on public lands. Call and interview scientists and data proprietors at non-profits, federal agencies, and universities to obtain access to key data layers. Interpret and leverage scientific information obtained via interviews with scientists and forest specialists to build library of temporal and geospatial data that characterizes the economic value of National Forests and equity differentials among different stakeholder groups. Conduct geospatial analyses to create visualizations of economic tradeoffs across landscapes using ArcGIS and QGIS software. Analyze National Visitor Use Monitoring data to estimate site visitation and recreation at the district level. Create geospatial layer that characterizes the economic value of timber on forests using the Forest Vegetation Simulator, ArcGIS ArcMap, and the FSVeg Spatial Data Analyzer toolkit. Reconcile compatibility issues between data sets using a plethora of tools, including R, Microsoft Excel, and Python. Define specifications for standalone online GIS client and interface with GIS technical support to build applet. Identify and catalog potential gaps in national data collection efforts to plan for future needs in forest management.

Geospatial Modeling of the Economic Value of Forest Stand Aesthetics
Synthesized environmental-economic literature on forest with U.S. Forest Service data from USDA PLANTS, FSVeg, FVS, and FACTS to create a spatially-explicit scale of relative values of forest stand aesthetic values for the Monongahela National Forest. Indexed values from regression estimates from Giergiczny et al.'s "Choice experiment assessment of public preferences for forest structural attributes" (Ecological Economics, Nov. 2015) to regional stand characteristic data to inform policy makers of particularly important areas of aesthetic values.

Launch the National Center for Natural Resource Economics Research (NCNRER)
Launched a U.S. Forest Service initiative to respond to emerging natural resource economics issues by leveraging expertise from within the Forest Service. Provided technical analysis and advice to the National Program Lead in Economics to support Forest Service programs pertaining to landscape restoration and compensatory mitigation. Assisted in maintaining directories of economics expertise within the Forest Service. Designed and maintained the "Ecosystem Services Tools Portal", an online clearinghouse of geospatial tools and methodologies for ecosystem services valuation. Evaluated and recommended ecosystem services valuation software, including i-Tree, ARIES, and InVEST, to senior research scientists and policy analysts within the agency for inclusion in future programs. Budgeted travel stipend to attend conferences and meetings to support Forest Service economists through outreach presentations and networking.

Design Urban Tree Shade Index Mobile App
Led team of four programmers to create GIS-enabled Shade Index mobile app to estimate shade provided by trees in Washington D.C. using open-source municipal data.

Center for Economics and Policy Research **CHARLOTTESVILLE, VA**
Weldon Cooper Center for Public Service **January 2014 – September 2015**
Research Assistant
Supervisor: Dr. William Shobe, (434) 982-5376

Email: shobe@virginia.edu
May contact
20 hrs/week

Research Assistance on Report on Appendix A-1 of the Virginia Energy Plan
Collaborated with the Director to evaluate the assertions contained in a state-commissioned study on the projected economic impacts of the EPA's Clean Power Plan in Virginia. Organized meetings with energy utility employees, state government officials, and other interested stakeholders to obtain data and exchange relevant information. Compiled and maintained datasets using Excel and R on Virginia's electricity demand growth, state renewable energy supply forecasts, and energy plant emissions figures. Developed static models with Excel tools to project future energy sector trajectories in Virginia and estimate the feasibility of different pathways in compliance with the EPA's Clean Power Plan federal regulation. Drafted, revised, and edited text and data visualizations for a final report, *Report on Appendix A-1 of the Virginia Energy Plan: Impacts of Proposed Regulations under Section 111(d) of the Clean Air Act*, published by the Weldon Cooper Center for Public Service, as well as for a presentation for the Virginia State Advisory Board on Air Pollution. Final report found that an official supplement to the 2014 Virginia Energy Plan overstated projected compliance costs for Virginia to comply with regulations limiting CO2 emissions in the electricity sector. Edited, revised, fact-checked a rejoinder to an official response to our initial publication.

Applied Policy Project **CHARLOTTESVILLE, VA**
University of Virginia, Batten School of Leadership and Public Policy **August 2014 – May 2015**
Graduate Student
Client: Virginia Department of Environmental Quality (VDEQ)
Advisor: Dr. Randall Lutter, (202) 328-5118
Email: rl4bh@virginia.edu
May contact
10 hrs/week

Compliance with the EPA's Clean Power Plan: Virginia's Challenges
Conducted an independent policy analysis for the VDEQ on the optimal way for Virginia to respond to the EPA's Clean Power Plan regulations on CO2 emissions from the electricity sector. Consulted and corresponded with stakeholders to gather information about Virginia's electricity sector and the implications of various policy alternatives. Ranked policy alternatives based on a mixed quantitative and qualitative assessment of the economic costs and benefits, as well as socioeconomic and equity concerns. Concluded that Virginia should join the Regional Greenhouse Gas Initiative (RGGI) cap-and-trade program to efficiently comply with the Clean Power Plan. Calculated that the Commonwealth of Virginia could generate approximately $3.6 billion in revenue by participating in a cap-and-trade program similar to RGGI. Final project received an 'A' grade.

U.S. Department of State **WASHINGTON, D.C.**
Bureau of Oceans and International Environmental and Scientific Affairs **June 2014 – August 2014**
Intern
Supervisor: Christina Chan, (202) 647-2764
Email: ChanC1@state.gov
May contact
40 hrs/week

Analysis of Adaptation Projects in Developing Countries
Tasked by the Office of Global Change to evaluate the cost-effectiveness of different climate change adaptation policies implemented by the governments of developing countries established under the Cancun Adaptation Framework. Analyzed developing countries' National Adaptation Plans and National Adaptation Programmes of Action to identify novel and effective adaptation measures and policy gaps. Designed a methodology to systematically survey the prevalence of the language of incentives in several countries' climate policies. Wrote a research paper for Foreign Affairs Officers that

concluded that developing countries' policies often lack concrete measures to incentivize public and private actors to adapt to climate change. Paper was circulated to Foreign Affairs Officers in the Office of Global Change.

U.S. Department of State **CHARLOTTESVILLE, VA**
Global Partnership Initiative **September 2013 – April 2014**
Virtual Intern
Supervisor: Lawrence Sperling, (202) 647-8196
Email: SperlingLI@state.gov
May contact
40 hrs/week

Research Support on Corporate Sustainability Partners
Researched the corporate sustainability initiatives of prominent United States companies. Wrote memos for supervisor recommending specific multinational companies to include in a new partnership spearheaded by the U.S. Department of State to encourage carbon mitigation from participating members. Conducted internship remotely.

University of Virginia **CHARLOTTESVILLE, VA**
Housing and Residence Life **August 2011 – May 2013, January 2015 – May 2015**
Resident Advisor
Contact: (434) 924-3736
May contact

Residential Advising at Woody, Page, and Hereford Dormitories
Advised 20 students per year on academic, extracurricular, and social issues while enforcing university policies and responding to crisis situations. Facilitated discussions among students about contentious issues to promote tolerance and conflict resolution. Managed activities budget for residents. In Spring 2015, returned to the position after being selected to replace an excused Resident Advisor midway through the academic year. Received "Resident Advisor of the Month" award during Spring 2015 for planning successful social events for residents and effectively counseling multiple students on personal issues.

AIDEM Valencia **VALENCIA, SPAIN**
Intern **September 2010 – December 2010**
Supervisor: Adela Sanjuan
Obtained Through: UVA Hispanic Studies, (434) 924-7155
May contact
4 hrs/week

Summarization of Employee Training Manual
Read and summarized Spanish-language training manual of Asociación de Iniciativas para el Desarrollo y el Empleo en el Medio Rural (AIDEM), a non-profit organization dedicated to finding employment opportunities for the disabled and underprivileged in Valencia, Spain. The objective of this project was to help quickly train future employees on AIDEM's operating procedures. Interfaced with AIDEM employees in Spanish to create database of potential partner organizations.

PUBLICATIONS

Chen, S. A., Escay, A., Haberland, C., Schneider, T., Staneva, V., & Choe, Y. (2018). Benchmark Dataset for Automatic Damaged Building Detection from Post-Hurricane Remotely Sensed Imagery. *arXiv preprint arXiv:1812.05581*.

Warziniack, Travis; Haberland, Christopher [and others]. Expected publication: 2020. Economics of Invasive

Species. In: State of the Science for Non-native Invasive Species. Washington, D.C.: U.S. Department of Agriculture Forest Service.

Haberland, Christopher; Marston, Jonathan. 2017. Spatial Modeling of Timber Ecosystem Services: Linking the FVS Econ Extension and FSVeg Spatial Data Analyzer to Map Stumpage Value. In: Proceeding of the 2017 Forest vegetation simulator (FVS) e-Conference. e-Gen. Tech. Rep. SRS-224. Asheville, NC: U.S. Department of Agriculture Forest Service, Southern Research Station. 164-169.

Haberland, Christopher. 2017. Mapping Ecosystem Services on the Monongahela National Forest. U.S. Department of Agriculture, Forest Service, Research and Development.

PROFESSIONAL CONFERENCES AND WORKSHOPS

- **International Spring University on Ecosystem Services Modeling** **BILBAO, SPAIN**
  Basque Center for Climate Change **May, 2016**
  Developed integrated environmental-economic watershed model using the k.Lab modeling language. Received over 80 hours of classroom instruction on environmental-economic modeling, Bayesian networks, and multi-criteria analysis
- **2016 Government-Wide Earth Day Hackathon** **WASHINGTON, D.C.**
  General Services Administration **April, 2016**
  Supervised group that created a user-friendly mobile app to calculate shade-index values for geographic areas in Washington, D.C.
- **FedGIS Conference** **WASHINGTON, D.C.**
  Esri **February, 2016**
  Learned about big data software applications for geographic information system applications
- **USDA Agricultural Outlook Forum** **ARLINGTON, VA**
  U.S. Department of Agriculture **February, 2016**
  Represented the Forest Service National Center for Natural Resource Economics (NCNRER)
- **16th National Conference and Global Forum on Science, Policy, and the Environment** **ARLINGTON, VA**
  National Council for Science and the Environment **January, 2016**
  Represented the Forest Service National Center for Natural Resource Economics (NCNRER)
- **Behavioral Sciences to Improve Agri-Environmental Programs** **WASHINGTON, D.C.**
  CBEAR **October, 2015**
  Discussion of latest developments in behavioral economics as applied to agricultural and environmental programs
- **Integrated Assessment Technical Workshop** **COLLEGE PARK, MD**
  Joint Global Change Research Institute **October, 2014**
  Learn about the technical aspects of the GCAM integrated climate change assessment model

AWARDS AND AFFILIATIONS

- **Foreign Language and Area Studies (FLAS) Fellowship** **March, 2017**
  Selected by the University of Washington's Middle East Center to receive a $33,000 fellowship sponsored by the U.S. Department of Education to study Arabic and computational linguistics during the 2017-18 academic year
- **Critical Language Scholarship** **June, 2013**
  Received a full scholarship from the U.S. Department of State to study Moroccan culture and the Arabic language in Rabat, Morocco for 8 weeks during the summer of 2013
- **Phi Beta Kappa** **April, 2013**
  Membership awarded for ranking among the top 10% of students at the College of Arts and Sciences of the

University of Virginia

- **John B. Adgers Scholarship** **May, 2012**
  Awarded $4,000 stipend for academic merit and South Carolinian and Virginian provenance
- **Golden Key International Honour Society** **September, 2011**
  Membership awarded for ranking among the top 15% of University of Virginia students
- **National Society of Collegiate Scholars** **March, 2010**
  Membership awarded for high academic merit
- **Eagle Scout** **July, 2008**
  Member of Troop 1577 in Herndon, VA

COMPUTER SKILLS

- Websites: HTML, CSS
- Programming: Python, Scala
- Microsoft Office: Word, Excel, Outlook, PowerPoint
- Machine Learning: Python (numpy, pandas, NLTK, mallet, word2vec, Tensorflow, scikit learn, scipy), R (boot, FNN, MASS, glmnet, tree, e1071, leaps, car)
- Database: MongoDB, Redis, SPARQL
- Cloud: Google Cloud Platform, AWS
- Geographical: ArcGIS, QGIS

LANGUAGES

- English - Native
- Spanish – Fluent
- Arabic - Advanced
- Persian – Intermediate
- Italian – Intermediate
- Basque – Beginner
- Portuguese - Beginner

CERTIFICATIONS

- Advanced-Mid Oral Proficiency in Arabic - ACTFL **August, 2013**
- Advanced-Low Oral Proficiency in Persian - ACTFL **August, 2012**