AUSTIN MADSON, PHD

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Yale Center for Geospatial Solutions (YCGS)
Yale University
37 Hillhouse Avenue, Room 112
New Haven, CT 06511

Earth scientist with research interests that intersect the hydrosphere, cryosphere, biosphere, and the lithosphere. I use models, in situ data, and remotely sensed data products to answer novel questions related to the four "spheres" mentioned above. Instructor with pedagogical interests in problem-based, place-based/experiential learning, and universal design for learning (UDL) techniques. I foster the ability to think critically and independently by employing clear learning outcomes, sound assessment strategies, innovative pedagogies, and cultivating UDL guidelines.

EDUCATION

Ph.D. UCLA, Geography. 2020. *Magnitudes, mechanisms, and effects from large-scale lacustrine changes*

M.A. UCLA, Geography. 2015. *ICESat derived lithospheric flexure as caused by an endorheic lake's expansion on the Tibetan Plateau and its rheological constraints*

B.A. UCLA, Geography, Minor in Geospatial Information Systems & Technologies, magna cum laude with Departmental Honors. 2012. *Sustainable farming methods with concern to water usage of Ventura County agriculture: Do local aquifer levels play a role on agriculture in the Oxnard and Pleasant Valley Basins of Ventura County?*

ACADEMIC POSITIONS

2025 - Present	Senior Remote Sensing Scientist, Yale Center for Geospatial Solutions
2025 - Present	Adjunct Faculty, University of Wyoming School of Computing & Hydrologic Science Program
2021 - 2025	Assistant Professor, University of Wyoming School of Computing & Wyoming Geographic Information Science Center
2021 - 2025	Program Faculty, University of Wyoming Hydrologic Science Program
2022 - 2024	Science/Project Advisor, UW NASA DEVELOP Pop-Up Node
2020 - 2021	Postdoctoral Research Scholar, UCLA
2014 - 2020	Teaching Fellow, UCLA
2014 - 2015	Geodetic Data Processor, UNAVCO/NSF
2012 - 2013	Center Lead, NASA DEVELOP - Jet Propulsion Laboratory (JPL)
2011 - 2012	Research Intern, NASA DEVELOP - Jet Propulsion Laboratory (JPL)

INDUSTRY EXPERIENCE

2019 - Present	Founder, Mad Nadir Mapping, LLC

I am the founder of Mad Nadir Mapping (MNM). MNM specializes in industry/research consulting, custom data logging equipment, purpose-built UAV multirotors (quad, hexa and octa), and we currently manufacture the lightest and most affordable all-inclusive UAV lidar scanning systems available on the market. (www.madnadirmapping.com)

2024 - Present Associate Editor, Lidar Magazine

As an associate editor I help run the Lidar Magazine Podcast Series by finding new guests, creating episode material, and generating podcast content. (https://lidarmag.com/podcast/)

RESEARCH INTERESTS

Lake/Reservoir Dynamics	Thermokarst Lakes	Wildfire Fuel Loads
Hydrologic Un/Loading	Post-fire Water Quality	Ground Deformation
Hydro-induced Seismicity	Surface Water Turbidity	Applied Remote Sensing
Landslides	Vegetation Health Changes	Geodesy

TECHNICAL EXPERIENCE

Lidar Remote Sensing (RS)	HPC/Cluster Computing	Metashape/Pix4d
Multispectral/Thermal RS	Data Parallelization	UAV Data Acquisition
Hyperspectral RS	AI/ML Workflows	UAV Construction
InSAR/PolSAR RS	Data Visualization	Ground Rover Construction
GNSS/RTK/PPK	Bash, Python, R	Ardupilot/PX4
Fieldwork Campaigns	GEE/Javascript	Sensor Fusion
Pixel Offsets	C, C++	FAA Part 107 Drone Pilot
Photogrammetry/SfM	QGIS/ArcMap/ArcGIS Pro	CAD/PCB Design
Spatial Data Processing	Envi/Erdas	Additive Manufacturing

PUBLICATIONS

Completed Journal Publications (* indicates mentee first author)

Liu, W., Li, S., Fan, D., Wen, Y., **Madson, A.**, Mitchell, J., He, Y., Yang, D., A Deep Learning Workflow for CORONA-based Historical Land Use Classifications, *IEEE JSTARS* (2025) https://doi.org/10.1109/JSTARS.2025.3582789

Barkat, A., Tan Y., & **Madson, A.**, Deciphering the interplay between reservoir loading and dynamic stresses at the Pertusillo Reservoir, *Seismological Research Letters* (2024) https://doi.org/10.1785/0220230387

*Wu, Y.-Y & **Madson, A.**, Error Sources of Interferometric Synthetic Aperture Radar Satellites. *Remote Sensing* (2024) https://doi.org/10.3390/rs16020354

Shi, X., Shu, Y., Chen, H., Han, L., **et al.**, Crustal response to water loads and expansion of triggered seismicity around the Xiluodu Reservoir, Southwest China. *The Innovation Geoscience* (2023) https://doi.org/10.59717/j.xinn-geo.2024.100047

Madson, A., Dimson, M., Fortini, L.B. et al., A near four-decade time series shows the Hawaiian Islands have been browning since the 1980s. *Environmental Management* (2022) https://doi.org/10.1007/s00267-022-01749-x

Liu, K., Ke, L., **et al.**, Ongoing drainage reorganization driven by rapid lake growth on the Tibetan Plateau. *Geophysical Research Letters* (2021). https://doi.org/10.1029/2021GL095795

Madson, A., & Sheng, Y., Automated water level monitoring at the continental scale from ICESat-2 photons. *Remote Sensing* (2021). https://doi.org/10.3390/rs13183631

Madson, A., & Sheng, Y., Coulomb stress analysis for several filling and operational scenarios at the Grand Ethiopian Renaissance Dam impoundment. *Environmental Earth Sciences* (2021). https://doi.org/10.1007/s12665-021-09591-w

Madson, A., & Sheng, Y., Reservoir induced deformation analysis for several filling and operational scenarios at the Grand Ethiopian Renaissance Dam impoundment. *Remote Sensing* (2020). https://doi.org/10.3390/rs12111886

Yuan, T., Lee, H., Yu, H., Jung, H., **Madson, A.**, Sheng, Y., & Beighley, E. Mapping forested floodplain topography using InSAR and radar altimetry. *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing* (2020). https://doi.org/10.1109/JSTARS.2019.2956400

Gillespie, T. W., **Madson, A.**, Cusack, C. F., & Xue, Y., Changes in NDVI and human population in protected areas on the Tibetan Plateau. *Arctic, Antarctic, and Alpine Research* (2019). https://doi.org/10.1080/15230430.2019.1650541

Madson, A., Fielding, E., Cavanaugh, K., Sheng, Y., High-resolution spaceborne, airborne, and in situ landslide kinematic measurements of the Slumgullion Landslide in Southwest Colorado. *Remote Sensing (2019)*. https://doi.org/10.3390/rs11030265

Sheng, Y., **Madson, A.**, Song, C., 2.02 GIS for paleo-limnological studies, In *Comprehensive Geographical Information Systems*, edited by Bo Huang, Elsevier, Oxford, Pages 28-36, (2018). ISBN 9780128047934, https://doi.org/10.1016/B978-0-12-409548-9.09632-9

Song, C., Sheng, Y., Wang, J., Ke, L., **Madson, A.**, & Nie, Y., Heterogeneous glacial lake changes and links of lake expansions to the rapid thinning of adjacent glacier termini in the Himalayas. *Geomorphology*, (2017). https://doi.org/10.1016/j.geomorph.2016.12.002

Journal Papers Under Review (* indicates mentee first author)

Chen. T., Cooley, S., **Madson, A**., et al., Reservoirs double the seasonal buffering capacity of global surface water, *Science Advances*

*Gallerani, E., Camp, R., Banko, P., **Madson, A.**, et al., Multi-scale vegetation health and climate analysis for range restricted endangered avian species in the tropics, *Global Ecology and Conservation*

*Wu, Y., & **Madson, A.**, Temporal Trends in Extreme Precipitation Events in Eight Flood-Prone U.S. Inland Cities, *Journal of Flood Risk Management*

*Wu, Y., & **Madson, A.**, Attribution Analysis of Flash Flood Probability Changes in Seven Flood-Prone U.S. Inland Cities in a Non-Stationary Climate, *Journal of Flood Risk Management*

Working Journal Papers (* indicates mentee first author)

*Kraemer, S., Watson, R., & **Madson, A.**, Reconstructing Glacial Lake Outburst Floods at Mammoth Glacier in Wyoming, *AGU Water Resources Research*

*Sobolewski, M. & **Madson, A.**, Wildland fire effects on surface water quality in the American West, *Undecided*

Madson, A., Holmes, R., & Bitzas, C., Monitoring sediment inflows into the Shoshone River using high resolution Planetscope data, *Undecided*

Madson, A., High resolution fuel loads across forested lands in Wyoming, *Undecided*

*Castaneda, S. & **Madson, A.**, High spatial and temporal resolution monitoring of Papaver somniferum cultivation before and after regime changes in Afghanistan, *Remote Sensing*.

Madson, A., & Handwerger, A., Low-cost and self-Contained GNSS landslide monitoring system: A study of the Portuguese Bend Landslide, *Landslides*.

*Wu, Y. & **Madson, A.**, Fusing high resolution remote sensing data and in situ gage products to monitor snowmelt-driven runoff events into the Shoshone River, *Remote Sensing*.

Barkat, A., Tan Y., & **Madson, A.**, Reservoir induced seismicity around the Tarbela Reservoir in Pakistan, *Journal of Geophysical Research – Solid Earth*

Ferriter, M., **Madson, A.**, & Cavanaugh, K., Sensitivity of vegetation structure metrics derived from high resolution UAS lidar data. *Undecided*

Ortiz-Villa, E., **Madson, A.**, & Cavanaugh, K., Vegetation and elevation changes in the San Dieguito Salt Marsh. *Undecided*

ACADEMIC CONFERENCES/WORKSHOPS

Presentations (* indicates mentee first author)

*Wu, Y., & **Madson, A.**, Climate Change Impacts on Precipitation and Flood Events Across U.S. Inland Cities (1996-2023). 2025, IEEE International Geoscience and Remote Sensing Symposium (IGARSS), Brisbane, Australia.

*Ortiz-Villa, E., Cavanaugh, K., Emory, K., Beheshti, K., **Madson, A.**, Fine Scale Elevation Change in Coastal Wetlands with UAV LiDAR and Structure from Motion, 2025, California Estuarine Research Society (CAERS), Costa Mesa, CA.

*Sobolewski, M. & **Madson, A.**, Detecting Water Reflectance Changes of Lakes Within Burned Watersheds in the Western United States. 2024, American Geophysical Union Fall Meeting, Washington, DC.

*Smedsrud, M., Hoffmeister, H., Rashid, B., Orimolade, O., Williams, C., **Madson, A.**, Assessing the Feasibility of Using Various Earth Observations to Monitor Environmental Trends Associated with River Flow Impediments Near Energy Intake Structures. 2024, American Geophysical Union Fall Meeting, Washington, DC.

*Wu, Y. & **Madson, A.**, Unraveling the Dynamics of Flash Floods: A Multi-Faceted Approach to Enhance Prediction and Mitigation. 2024, I-GUIDE Forum

*Sobolewski, M. & **Madson, A.**, Detecting changes in surface water reflectance of lakes in burned watersheds within the Western United States. 2023, GIS In the Rockies.

Williams C., Holmes R., Campbell, W., Ferrante, C., Lemnyuy, N., Bitzas, C., Greene, J., St. John, I., **Madson, A.** Assessing sediment inputs into the Shoshone River in Wyoming to

determine areas for protection and restoration practices. 2023, American Association of Geographers Annual Meeting, Denver, CO.

*Wu, Y., **Madson, A.**, Link between increasing precipitation extremes and flood events – Regional case study in Louisville, Kentucky. 2023, IEEE International Geoscience and Remote Sensing Symposium (IGARSS), Pasadena, CA.

Shi, X., Shu, Y., Chen, H., Han, L., **et al.**, Lithospheric flexural response to water loads and triggered seismicity around a large reservoir. 2023, Asia Oceania Geosciences Society (AOGS)

*Wu, Y., **Madson, A.**, Discussion on the parameters of the Goldstein filtering function within SNAP. 2022, NISAR Science Community Workshop, Pasadena, CA.

*Wu, Y., **Madson, A.**, Discussion on the Goldstein filtering parameters within the SNAP software. 2022, American Geophysical Union Fall Meeting, Chicago, IL.

Madson, A., Low-cost landslide GNSS monitors and a ground-based all-wheel drive rover for precise surface elevation transects. 2019, American Geophysical Union Fall Meeting, San Francisco, CA.

Madson, A., A Comparison of several of the latest high-resolution spaceborne, airborne, and in situ landslide kinematic measurement techniques utilizing the Slumgullion Earthflow Natural Laboratory in Southwest Colorado. 2016, American Geophysical Union Fall Meeting, San Francisco, CA.

Madson, A., ICESat Derived crustal flexure as caused by the expansion of an endorheic lake on the Tibetan Plateau. 2015, American Geophysical Union Fall Meeting, San Francisco, CA.

Madson, A., Barron, S., Sehler, R., Sacramento-San Joaquin Delta disasters and water resources: NASA radar remote sensing for levee health assessment. 2013, American Association of Geographers Annual Meeting, Los Angeles, CA.

Madson, A., Laygo K., O'Connell, K., Utilizing radar remote sensing to assess the water extent along river levees. 2012, American Geophysical Union Fall Meeting, San Francisco, CA.

Peer Reviewed Proceedings (* indicates mentee first author)

*Wu, Y. & **Madson, A.**, A discussion on the Goldstein filtering parameters within the SNAP software. 2023, *IEEE International Geoscience and Remote Sensing Symposium Proceedings*

INVITED TALKS/SPEAKER/PANELIST

"Applications of spatial data analytics and remote sensing for the environmental sciences" February 2024, Cal Poly SLO – Department of Natural Resources Management and Environmental Sciences

Panelist - NASA DEVELOP 2024 Academic Panel, February 2024, Virtual

"Landslide monitoring using UAS" February 2024, University of North Carolina-Wilmington – Department of Earth and Ocean Sciences

"Applications of remote sensing and image processing for the Earth sciences" February 2024, University of North Carolina-Wilmington – Department of Earth and Ocean Sciences

"Assessing sediment inputs into the Shoshone River to determine areas for protection and restoration practices" January 2024, Wyoming Water Forum, Cheyenne, WY

"Geomorphic, geophysical, and hydrologic applications of remote sensing" November 2020, University of Wyoming, Laramie, WY

"A discussion on teaching, guiding, and mentoring tomorrow's leaders in the geospatial industry" November 2020, University of Wyoming, Laramie, WY

"Central US Disasters: Visualizing the New Madrid Earthquake Seismic Zone for improved hazard assessments" August 2012, NASA DEVELOP Closeout Featured Presentation Session, NASA Headquarters, Washington D.C.

"RADAR Love – NASA DEVELOP students utilize airborne RADAR data for a variety of uses" December 2012, Ignite@AGU, Infusion Lounge, San Francisco, CA

GRANTS

Current

PI: "Quantifying high resolution forest metrics to mitigate changes in post-fire surface water quality by informing forest management practices in Wyoming" 2025 - 2028. USGS/Wyoming Water Research Program. $200,000

Co-PI: "Remote Pavement Roughness Estimation Using Deep Learning and Synthetic Aperture Radar Data" 2025 - 2026. UW College of Engineering and Physical Science Engineering Initiative. $18,000

Collaborator: "CAREER: Defining the Role of Snow in Storing and Transmitting Liquid Water to Generate Streamflow" 2025 - 2030. Best Practices for UAV Data Collection, $5,000

PI: Fellow -- UW Advanced Research Computing Center (ARCC) Medicine Bow Cluster Early Adapters Program. 2024 - 2025. 2,000,000 CPU Hours and 75,000 GPU Hours

PI: "Monitoring the *Yermo xanthocephalus* (desert yellowhead) using high resolution UAS data and novel AI/ML workflows" 2024 - 2026. Bureau of Land Management Wyoming (WY) Plant Conservation and Restoration Management. $63,000

Co-I: "WyUAS-UP (Wyoming Uncrewed Aerial System - an Upgraded Platform)" 2024 - 2025. UW College of Engineering and Physical Science Engineering Initiative. $55,835

PI: "Combining ICESat-2 photons with high resolution multispectral data for the monitoring of thermokarst lake dynamics in the North American Arctic" 2023 - 2026. NASA Rapid Response Research. $100,000

PI: "High resolution upland and riverbank erosion monitoring to inform best management practices that seek to reduce sediment accumulation at the Willwood Dam" 2023 - 2026. USGS/Wyoming Water Research Program. $239,000

Completed

PI: "Leveraging airborne data products and high performance computing with novel AI/ML workflows to investigate large scale wildland fire fuel loads in Wyoming" 2023 - 2024. Wyoming NASA EPSCoR Faculty Research Grant. $30,000

PI: “Development of an active learning-based course: UAS design, buildout, and integration” 2022 - 2023. NASA Wyoming Space Grant. $5,000

PI: “Wildfire-driven changes to riverine and lacustrine water quality in the American West” 2022 - 2023. NASA Wyoming Space Grant. $20,000

PI: “Enhancing student technology to support undergraduate/graduate learning and research in the spatial and data sciences” 2022. UW Central Student Technology Committee. $10,000

TEACHING EXPERIENCE

University of Wyoming
GIST 3140: Introduction to Remote Sensing *(x4)*
GIST 4211/5211: Advanced Remote Sensing *(x3)*
GIST 4450/5450: UAS Data Acquisition & Processing *(x3)*
GIST 4790/5790: Special Topics - UAS Design, Buildout, and Integration *(x1)*
GIST 4950: Undergraduate Research in GIST *(x1)*
GIST 5111: Introduction to Remote Sensing *(x1)*
GIST 5960: GIST Thesis Research *(x6)*

UCLA
Instructor of Record – 2x Summer Sessions
GEOG 7: Introduction to Geographic Information Systems *(x2)*
GEOG 167: Cartography *(x1)*

Teaching Assistant/Associate/Fellow – 18 Total Quarters
GEOG 5: People and Earth's Ecosystems *(x2)*
GEOG 7: Introduction to Geographic Information Systems *(x1)*
GEOG 169: Satellite Remote Sensing & Imaging Geographic Information Systems *(x1)*
GEOG 170: Advanced Geographic Information Systems *(x5)*
GEOG 172: Remote Sensing: Digital Image Processing & Analysis *(x1)*
GEOG 173: Geographic Information Systems Programming & Development *(x6)*
GEOG 174: Advanced Remote Sensing *(x2)*

MENTORSHIP EXPERIENCE

PhD Committee Chair
Aidana Mukhamedina (2023 - Present)
Yen-Yi Wu (2022 - Present)

MS Committee Chair
Maggie Sobolewski, Sean Castaneda (2023 - 2025)

PhD Committee Member
James Amato (2024 - Present)
Emelly Ortiz-Villa (2024 - Present)

MS Committee Member
Sean Kraemer (2025 - Present)
Price Akiina (2023 - Present)

Akib Zaman (2023 - 2024)

MS/PhD Data Advisor
Erik Schoenborn, Camila Brown, Kori Mooney (2022 - Present)
Melissa Ferriter, Chandan Shilpakar (2024 - Present)

Undergraduate Research
Mitchell Swetich (2021 - 2022)
Sean Kraemer (2024 - 2025)

Science/Project Advisor
UW NASA DEVELOP (2022 - 2024)
Brittany Hays, Alec Wallen, Mark Cervantes, Teodora Rautu (Spring 2024)
Marisa Smedsrud, Hayden Hoffmeister, Barira Rashid, Oluwatosin Orimolade (Summer 2023)
Robyn Holmes, Isabella St John, Christian Bitzas, Jillian Greene (Spring 2023)
Robyn Holmes, Cassie Ferrante, Will Campbell, Nelson Lemnyuy (Fall 2022)

9H UAS SmartRanch Student Projects (2022 - 2023)
Sean Castaneda (Summer 2023)
Chloe Mattilio, Emma Jones, Trevor Johnson, Ezekiel Bolze (Summer 2022)

HONORS & AWARDS

2024	Learning Actively Mentoring Program (LAMP) Fellow, UW
2023	Wyoming NASA EPSCoR Travel Grant
2022	Wyoming NASA EPSCoR Travel Grant
2019	DLR TanDEM-X Data Proposal HYDR2283
2019	ASI COSMO-SkyMed Data Proposal ID716
2018	University Teaching Assistant Award Nominee, UCLA
2018	Departmental Teaching Assistant Award Recipient, UCLA
2017	Doctoral Student Travel Grant, UCLA
2017	NSF XSEDE Compute Proposal TG-EAR160041
2017	DLR TerraSAR-X Data Proposal LAN3344
2016	DLR TerraSAR-X Data Proposal LAN3340
2016	Graduate Summer Research Mentor Program Recipient, UCLA
2015	Graduate Summer Research Mentor Program Recipient, UCLA
2013	Graduate Division Assistantship Fellowship, UCLA
2012	Highly Commended Paper, The Undergraduate Awards
2012	Blackman Family Award Recipient (Highest GPA in major), UCL

OTHER

University Service

2023 - 2025	Statewide Lidar Project Advisor
2023 - 2024	SoC Applied Comp. Sci. & Eng. Search Committee
2022, 2023, 2024	WY NASA Space Grant Proposal Reviewer
2022	Faculty Advisor UW Geospatial Club
2022 - 2025	WInSAR Institutional Representative
2021 - 2022	GIST RS Curriculum Development

Professional Service

2025	AGU Distributed Sensing Technical Cmte.
2025	Lead Judge - WY State Science Fair
2024	NASA DEVELOP Mentor
2023, 2024, 2025	AGU OSPA Session Liaison
2021, 2022, 2023, 2024, 2025	AGU OSPA Judge
2023, 2024	AGU Session Co-chair
2022, 2025	AGU Session Co-convener
2022	Mullen Fire Burn Scar Hydrology Advisor

Professional Development

2023	UCGIS Symposium
2023	LAMP Science Initiative Summer Institute
2023	UW National Lab Day
2023	39th Annual Meeting of the Gilbert Club
2023	NSF CAREER Workshop
2022	NASA OPERA Workshop
2022	Wyoming GeoPass
2022	NASA-ISRO NISAR Science Community Workshop
2021	NASA EPSCoR RII Track-2 Webinar
2021	Introduction to Planet Satellites, Imagery, and Data Access
2021	Planet Explore: User Conference
2020	XSEDE HPC Workshop Summer Boot Camp
2019	Advanced Computing and Data Analytics using Comet
2014 - 2019	UCLA Annual TA Pedagogy Workshop
2017	InSAR Processing & Theory w/ GMTSAR: Sentinel-1A Time Series
2017	CIG/NSF Crustal Deformation Modeling Tutorial and Workshop
2015	Advanced InSAR Processing
2014	InSAR: An Intro to Processing & Applications using ISCE/GIAnT

Reviewer

Geography and Sustainability, Mathematical Biosciences and Engineering, Nature, Remote Sensing, Remote Sensing of Environment

Media Coverage

Satellite study shows subtle signs of climate change in Hawaii, *Honolulu Star-Advertiser*, 2023
https://www.staradvertiser.com/2023/01/30/hawaii-news/satellite-study-shows-subtle-signs-of-climate-change-in-hawaii/

Hobbies

Soccer, Biking, Hiking, Backpacking, Tinkering, Woodworking, Outdoor Naps

Professional Organizations

Association of American Geographers (AAG)
American Geophysical Union (AGU)
American Society of Photogrammetry and Remote Sensing (ASPRS)

Gilbert Club
University Consortium for Geographic Information Science (UCGIS)

Completed/In-Progress Side Projects

- Custom lidar monitors for raw concrete material pits – Design and buildout for custom static lidar systems to automatically calculate and track raw materials for large-scale concrete manufacturing
- Automated runway crater/debris monitoring – Design and buildout of a custom UAS lidar system and post-processing software to locate runway crater/debris and derive their volumes
- Custom mobile lidar systems – Design and buildout of custom mobile (truck-based) lidar mapping systems for the monitoring of utility corridor vegetation encroachment
- Custom UAV Multirotors -- Design and buildout of custom multirotors (quad and hexacopters) based on the arducopter flight stack
- Custom UGV Ground Rover -- Design and buildout of a custom semi-autonomous 6-wheel AWD ground rover based on the ardurover "flight" stack
- Urban Forage -- Set of interactive maps highlighting locations of city-owned and maintained edible plant species within the City of Santa Monica. www.urbanforage.org [defunct]
- Landslide Monitors -- Self-contained landslide measurement systems utilizing custom power systems, L1 GNSS sensors, open-source processing, and Raspberry Pi hardware
- The Great (Commuter) Divide -- Mapping commuter routes from/to the San Fernando Valley to/from Santa Monica based on ~500,000 Google Maps Directions API calls to determine the spatial divides of commuter routes through time based on historical traffic data
- Bird of Prey (BoP) Monitor -- Machine learning for automated (every 5 seconds!) BoP monitoring in the Santa Monica Mountains
- "Scarboro" Home Assistant -- Development of a custom home assistant using a Raspberry Pi and an on-board voice recognition model (no active online listening!)