ANDREW A. GANSE

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PROFILE

Data and applied scientist with background in machine learning (including deep/transfer learning), computer vision, tracking and sensor fusion, inverse problems, databases, and analyzing messy data. Strong communication skills; prefer scientist roles developing solutions for physical sensor data with machine learning, while hiring and managing small teams, coordinating senior team members, and mentoring junior team members and interns.

EDUCATION

Ph.D. Geophysics, University of Washington.
B.S. Electrical Engineering, University of Washington.

PROFESSIONAL EXPERIENCE

Senior Imaging Data Scientist, ThruWave Inc. *July 2020 – present.*
- Architecting and managing development of the company's analytics modeling platform, using computer vision and machine learning to automate interpretation of 3D millimeter-wave radar imaging and RGB and depth-camera images; for fulfillment, warehouse inventory management, retail shelf stocking, and manufacturing. OpenCV, Scipy, Scikit-learn, REST APIs, Docker.
- Leading our 4-member data science team in that dev and in customer applications of this analytics system, whose success has resulted in company entering multiple pilots at big-name corporations.
- Designing, developing, and managing the company's test database system driving our model performance analyses and machine learning, using PostgreSQL and Python.
- Investigating and optimizing the joint performance of 3D image reconstruction algorithms (inverse problems) and the analytics models (CV, machine learning) that operate on the images.

Radar Data Scientist, R&D Team, Echodyne Corporation. *Dec 2017 – July 2020.*
- Project team member on multiple machine learning projects in detection and classification on novel radar data for drone, security, and automotive problems. Scikit-learn, Keras, Tensorflow, TitanV's.
- Designed and build-out machine learning workflow framework for training, feature experimentation, and field evaluation of classification models. Docker, MLflow, PostgreSQL.
- Led analyses characterizing the performance of radar target detection and tracking using Python/Pandas, iterating directly with product manager.
- Led design and development of the company's field-test database system driving the company's machine learning and radar performance analyses, using PostgreSQL and Python.
- Hiring manager for data engineer position supporting some of this work. Technical management of 2-5 people per project in multiple concurrent projects; co-organizer of company intern program.

Principal Scientist, Anseres Research & Technology LLC. *Sept 2016 – Dec 2018.*
- Scientific research consulting in defense, geophysical, and space science applications.
- Completed multiple federal R&D subcontracts building on some of my earlier research in statistical inference for remote sensing problems.
- Led SBIR proposal submission on Deep Learning for Clutter Reduction in [Sonar Systems], with university collaborators.

Data Scientist, Spare5. *Jan 2016 – June 2016.*
- Designed and developed machine learning algorithms for data quality assessment and user reputation evaluation on Spare5's intelligent crowdsourcing platform.
- Innovated in the use of probabilistic classifiers, expectation maximization, word2vec; using R/Rserve, Python/Pandas, PostgreSQL, Git.
- Engaged in press/analyst briefings, meetings with customers, public speaking (Datapalooza).

Senior Research Physicist, Applied Physics Laboratory, Univ. of WA. Apr *1999 – Nov 2015.*
- Solved nonlinear regression, inversion, optimization, tracking, and signal processing problems in acoustic, seismic, electromagnetic, and gravity remote sensing applications; using Python, Matlab, Octave, C, Java, Fortran, Linux shell scripting; administrated Linux clusters.
- Developed Kalman nonlinear smoothing/tracking and parameter estimation algorithms to acoustically track a 5km(!) long vertical hydrophone array for our ocean acoustic experiment.
- Analyzed fluctuations in intensity and pulse spreading of ocean acoustic signals interacting with ocean internal waves, testing prevailing theory with our at-sea experimental measurements.
- Created Markov Chain Monte Carlo based Bayesian inversion of acoustic data on a Linux cluster.
- Organized technology transfer of a new APL-developed technology to a small business.
- Designed research experiments, presented results at conferences, wrote proposals and reports to sponsors, interfaced with sponsors, wrote and reviewed research papers.
- Led system engineering and field testing for an experimental "towed CTD chain" cabled instrument containing 90 sensors, managed teams of 2-6 others at a time in testing and operation of the system. Managed two students in statistical programming projects.

ADDITIONAL EXPERIENCE

- **Industry consultant for undergraduate computer vision project.** *Jan 2019 – Apr 2019.*
  DigiPen Institute of Technology; Prof. Jeremy Thomas, co-advisor.
  Advised student on senior project in computer vision for traffic flow analysis based on automated photo recordings, using a pre-trained deep learning model.

RECENT PUBLICATIONS AND PRESENTATIONS (see website for more)

- **Ganse A.A.**, C.M. Madden, C.M. Watts, A. Pedross-Engel, M.S. Reynolds, "High-throughput anomaly detection in document envelopes with 3D millimeter wave imaging". Proc. SPIE, 11745-14. Passive and Active Millimeter-Wave Imaging XXIV. April (2021).
- **Ganse, A.A.**, "An eigenspectrum filter-factors approach to interpreting regularization and subspace methods", presentation at Echodyne Corporation, Dec 2019.
- Roberts, J.H., S. Vance, **A.A. Ganse**, "Detection of Gravity Anomalies on Europa using Line-of-sight Gravity Profiles", Abstract P42B-06, Fall Meeting AGU, San Francisco (2018).
- Andrew, R.K., **A.A. Ganse**, A.W. White, J.A. Mercer, M.A. Dzieciuch, P.F. Worcester, "Low-frequency Pulse Propagation over 510 km in the Philippine Sea: A Comparison of Observed and Theoretical Pulse Spreading", *J. Acous. Soc. Am.*, 140, 1 (2016).
- **Ganse A.A.**, S. Vance, and J. Roberts (2014), "Inverse theory resolution analysis in planning radio science gravity investigations of icy moons", Abstract P43C-3997, Fall Meeting AGU 15-19 Dec, San Francisco (2014).
- **Ganse A.A.**, R.K. Andrew, F.S. Henyey, J.A. Mercer, P.F. Worcester, M.A. Dzieciuch, "Model and data comparisons of ocean acoustic intensity statistics in the Philippine Sea 2010 experiment", *J. Acoust. Soc. Am.* 135 , 2306 (2014).