**Ross Cheung, Ph.D.** ross@insightm.com

**EDUCATION**

**Ph.D. Atmospheric and Oceanic Sciences**, Los Angeles, CA, December 2016

Thesis: MAX-DOAS measurements of aerosol, HCHO, and NO2 over Los Angeles from an elevated mountaintop site, Advisor: Dr. Jochen Stutz

**M.S. Atmospheric and Oceanic Sciences**, Los Angeles, CA, June 2010.

**B. S. Mathematical and Computational Sciences**, **Stanford University**, Stanford, CA, June 2006

**RESEARCH AND PROFESSIONAL EXPERIENCE**

**Senior Scientist - Insight M,** Remote,

October 2021 - Present

* Supported R&D efforts to update sensor capabilities and core retrieval algorithms for spectroscopy, and modernize the analysis pipeline by contributing to the Python code base.
* Developed Data Science analysis tools, including building new models to understand and estimate basin-wide distributions of methane emissions.
* Improved Insight M’s core algorithm and various legacy code through pipeline stabilization, improved testing, diagnosis of critical issues, and code refactoring/improvement

**Data Scientist**, Agency Enterprise Studio, Venice, California

September 2020 - September 2021

* Improved accuracy of a prototype brain-computer interface by training a 1-D Convolutional Neural Network in PyTorch to detect human activity.
* Developed and improved a computer vision algorithm to derive wellness scores of user's health from mobile phone images, for the core product of a client startup.
* Reduced customer service by building a Natural Language Processing-based machine learning model for better handling automated SMS-based responses.

**Machine Learning Consultant**, AI Photonics, Remote

December 2018 - September 2020

* Solved image processing-related algorithmic challenges for a commercial LIDAR system designed to aid architects and construction workers in making precise measurements of building dimensions
* Designed computer vision algorithms using Python, numpy, and sklearn to separate point clouds and highlight edges into planes using clustering and neural-network based techniques. Highlights include plane separation/edge detection using RANSAC and Hough Transform, and neural networks for point clouds.

**Data Science Fellow**, Insight Data Science, New York City, New York

January 2020 - May 2020

* Recommended best jobs to candidates from underprivileged backgrounds by building a recommendation system, using a novel cosine similarity and matrix factorization model in Python for a client.
* Merged data on 7 million data points from SQL databases, to find similarity scores between job seekers and job descriptions in order to train internal models.
* Delivered recommendations that improved the quality of job descriptions shown to users by 25%

**Air Quality Specialist**, South Coast AQMD, Diamond Bar, California

May 2017 - January 2020

* Aided affected community members by performing analysis of data on emitted pollutants directly affecting them, and communicated the results to policy makers seeking to draft legislation.
* Spearheaded the development of a Python codebase to analyze the capabilities of spectrometers to observe air pollutants and to visualize data real-time on maps on the web.
* Conducted atmospheric radiative transfer modeling to simulate and analyze the efficacy of atmospheric optical systems to detect and observe trace gas concentrations for continuous monitoring applications
* Built Python internal tools used for scientific and monitoring purposes at the AQMD.

**Graduate Student Researcher**, UCLA, Los Angeles, CA

October 2009-December 2016

* Conducted 2 million measurements of trace gas precursors to smog formation over Los Angeles over a five year period to better understand the chemistry behind air pollution over an urban area.
* Developed new techniques to filter for clouds in millions of atmospheric remote sensing measurements and perform inverse modeling techniques for atmospheric sounding.
* Conducted field campaign measurements of air quality over urban and remote areas, including the Los Angeles air basin, Houston, and rural Uintah basin.
* Published 10 papers during PhD research. Taught 7 different classes on climate, meteorology, and atmospheric chemistry, led discussion sessions of up to 30 people at a time.

**PEER REVIEWED PUBLICATIONS (selected)**

Tsai, C., M. Spolaor, S. F. Colosimo, O. Pikelnaya, **R. Cheung**, E. Williams, J. B. Gilman, B M.

Lerner, R. J. Zamora, C. Warneke, J. M. Roberts, R. Ahmadov, J. de Gouw, T. Bates, P. K. Quinn, J.

Stutz (2018). Nitrous acid formation in a snow-free wintertime polluted rural area. Atmos. Chem. Phys., 18, 1977–1996, https://doi.org/10.5194/acp-18-1977-2018.

Werner, B., J. Stutz, M. Spolaor, L. Scalone, R. Raecke, J. Festa, S. F. Colosimo, **R. Cheung**, C. Tsai, R. Hossaini, M. P. Chipperfield, G. S. Taverna, W. Feng, J. W. Elkins, D. W. Fahey, R.-S. Gao, E. J.

Hintsa, T. D. Thornberry, F. L. Moore, M. A. Navarro, E. Atlas, B. Daube, J. Pittman, S. Wofsy, K.

Pfeilsticker (2017). Probing the subtropical lowermost stratosphere, tropical upper troposphere, and tropopause layer for inorganic bromine, Atmos. Chem. Phys., 1-43, doi:10.5194/acp-2016-656.

Stutz, J., B. Werner, M. Spolaor, L. Scalone, J. Festa, C. Tsai, **R. Cheung**, S. F. Colosimo, U. Tricoli,

R. Raecke, R. Hossaini, M. P. Chipperfield, W. Feng, R.-S. Gao, E.J. Hintsa, J. W. Elkins, F. L. Moore,

B. Daube, J. Pittman, S. Wofsy, K. Pfeilsticker (2017). A New Differential Optical Absorption Spectroscopy Instrument to Study Atmospheric Chemistry from a High Altitude Unmanned Aircraft. Atmos. Meas. Tech. Discuss., 1-48, doi:10.5194/amt-2016-251.

Olaguer, E., J. Stutz, M. H. Erickson, S. C. Hurlock; **R. Cheung**, C. Tsai, S. F. Colosimo, J. Festa, A.

Wijesinghe, B. S. Neish (2017). Real Time Measurement of Transient Event Emissions of Air Toxics by Tomographic Remote Sensing in Tandem with Mobile Monitoring. Atmospheric Environment., 150, 220-228.

**Cheung, R.,** K. F. Li, S. H. Wang, T. Pongetti, R. P. Cageao, S. P. Sander, Y. L. Yung (2008). Atmospheric hydroxyl radical (OH) abundances from ground-based ultraviolet solar spectra: an improved retrieval method. Applied Optics, 47(33), 6277-6284.

Wang, S. H., H. M. Pickett, T. J. Pongetti, **R. Cheun**g, Y. L. Yung, C. Shim, Q. B. Li, T. Canty, R. J.

Salawitch, K. W. Jucks, B. Drouin, S. P. Sander (2008). Validation of Aura Microwave Limb Sounder OH measurements with Fourier Transform Ultra-Violet Spectrometer total OH column measurements at Table Mountain, California. Journal of Geophysical Research-Atmospheres, 113(D22301). DOI: 10.1029/2008JD009883.