

# Joel Silverman

## Data Scientist

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Adaptable and dependable data scientist with a passion for enabling data-driven decisions. I thrive in a culture that values creativity, collaboration, and integrity. Domain knowledge in public services, natural sciences, mapping, and image processing.

### TECHNICAL SKILLS

- Machine learning, statistical inference, and data visualization using Python programming language.
- Python libraries include: Scikit-learn, Pandas, NumPy, TensorFlow, Keras, and Beautiful Soup
- Other Software: SQL, Git, R Programming Language, SAS, ArcGIS, Tableau, Access, and Excel.
- Platforms: Google Colab, PySpark, AWS EC2, Google BigQuery.
- Interdisciplinary teams, leadership, problem solving, and project management.

### PROFESSIONAL EXPERIENCE

#### **Data Scientist Fellow - *General Assembly, Remote, November 2021 - March 2022***

- Completed 12-week, 480-hour training with instruction from data scientists. Completed 6 projects and 30+ assignments using Python programming skills to explore a wide range of machine learning techniques and statistical methods including regressions, classifications, neural networks, PCA, cluster analysis, Bayesian statistics, and time series analysis. Work included examples with bioscience diagnostics and treatment efficacy.
- Scraped website data using APIs, cleaned data, conducted data visualization, and engineered variables. Built pipelines to automate processes for scaling.
- Learned about standard ML paradigms, deep learning frameworks, and ML infrastructure (CI/CD & MLOps).
- Project: Trained a convolutional neural net to classify food photos on Yelp to allow the automation of sorting and filtering by photo quality. Used both from-scratch and transfer-learning methods.
- Project: Used Natural Language Processing to differentiate human forum-based discussion from GPT2 chatbots that were trained to mimic forum-based discussion. Achieved 90% accuracy.
- Project: Led visualization of data in a small group project developing time-series models. Models predicted near-term energy demand for Texas energy (96% accuracy). Results allow customers to save costs and move toward renewables.
- Project: As an intro Kaggle hackathon, trained a convolutional neural net to classify 100 species of flowers from images. Used TensorFlow and TPUs on Google Colab for improved performance.

#### **Resource Specialist - *US Forest Service, Pinecrest, CA, September 2014 - November 2021***

- Established an end-to-end online permit system for visitors, saving approx. 1000+ staff hours annually.

- Organized a database of 30,000+ customer records, applied analytics, and generated reports which leveraged customer data to provide insights to management regarding changing use patterns. Solved problems both technical and strategic.
- Provided mentorship as a supervisor to employees (3 to 6 per year), individual volunteers (2-4 per year), and to groups.
- Wrote successful requests for funds and completed all grant projects on time and within budget.
- Produced time-sensitive mapping analysis & products such as joined road files for routing firefighters during wildfires.
- Reliably achieved objectives and key results (OKRs) in a dynamic environment, working alone and in teams on wildfires.
- Presented to various public, partner, and stakeholder audiences, where judicious written and verbal communication skills were critical.

#### **Resource Specialist – *Midpeninsula Regional Open Space District, Los Altos, CA, July 2010 - July 2014***

- Developed study designs: articulating objectives, selecting statistical methods, adapting sampling methods, collecting data, analyzing data, and reporting findings as part of a data-driven management approach to ecosystem management.
  - Designed and piloted a grassland monitoring program to measure treatment effects on native vegetation.
- Led agency Science and Conservation Permit Program working with universities and agencies conducting scientific research on MROSD lands.
  - Reviewed 150+ research proposals, assessed potential impacts, wrote conditions, and reviewed technical reports for management implications.
- Developed tabular and mapping data for numerous hands-on projects using a “Day One” outlook to respond to needs.
- Agency representative in several stakeholder groups and advisory committees to facilitate cooperative land management and articulate the organization’s vision. Required tactful communications skills.

#### **Fire Ecologist / Lead Monitor - *National Park Service, Springdale, UT, May 2008 - July 2010***

- Led a long-term scientific monitoring program for Zion National Park measuring the effectiveness of vegetation treatments in reaching quantified objectives within set confidence limits. Led data collection, statistical analysis, and program reporting. Provided leadership and growth opportunities for a talented crew of 3 staff.
- Conducted GIS mapping analysis for the program: calibrated time series thermal band satellite images using zonal statistics, applied normalization equations, generated random stratified samples, and processed GPS datasets.
- Worked with university and government scientists on several high-impact ecological research projects.
- Presented results, communicated technical advice, and discussed program goals with various public and professional audiences.

#### **Graduate Research Assistantship, *NASA, Fort Collins, CO, January 2006 - May 2008***

- Awarded NASA Research Assistantship.
- Conducted research with scientists from NASA’s Earth Observation Science Program and applied scientists at NPS.
- Used models for prediction and hypothesis testing relating to wildfire and invasive plant distribution. This required a literature review, extensive analysis of diverse GIS data types, and developing/optimizing statistical models.
- Developed new methods for analyzing a complex series of raster and vector datasets to resolve issues of chronology and spatial autocorrelation in models that include disturbance processes as independent variables.
- Conducted statistical analysis in R Programming Language and ArcGIS.
- Utilized MODIS and LANDSAT imagery such as NDVI, EVI phenology, and dNBR burn severity products. Experience using elevation models, climate surfaces, distance surfaces, hydrologic data, vegetation coverages, geologic data, & transportation networks.
- Gave professional presentations (oral and written) at conferences, symposia, and workshops.

## EDUCATION

### Data Science Immersive Certificate - *General Assembly, Washington D.C (Remote)*

- See **Data Science Fellow** in section above.

### Master of Science - *Colorado State University*, Fort Collins, CO

- Thesis: developed statistical models of species distributions using remote-sensing data, mapping software, and statistical software. Worked primarily in Applied Statistics. MS in Forest Sciences.
- Courses: Spatial Statistics & Modeling, Statistics (Data Design and Analysis), Other Courses: GIS Analysis.
- Also see **Graduate Research Assistantship** in section above.

### Bachelor of Arts - *The Evergreen State College*, Olympia, WA

- Human & Cultural Geography, Study Abroad (Central America).
- Plant Biology, Natural Resource Management.

## SELECTED AWARDS

- USFS & NPS Certificates of Appreciation
- NASA Graduate Fellowship Award (Graduate Research Assistantship with Full Tuition)
- Colorado State University Student Organization Educational Event Award

## PERSONAL INTERESTS

- Tech & Business News, Landscape Photography, World History, Astronomy, Nature
- Trail Running ([Muir Woods](#) and [Stinson Beach](#) Marathons), Skiing, Backpacking