

# Krishna Karra

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## PROFESSIONAL EXPERIENCE

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### Ceres Imaging, Geospatial Data Scientist

2023 – Present

- Developing models based on satellite imagery to quantify sustainable management practices (e.g. tillage, cover cropping, biodiversity) on agricultural lands.
- Designing a satellite imagery software suite built on Google Earth Engine to rapidly prototype new models, facilitate data access and interactively visualize results.

### The Cooper Union for the Advancement of Science and Art, Adjunct Professor

2021 – Present

- Teaching a graduate level class in the Electrical Engineering department, titled “Fundamentals of Remote Sensing and Earth Observation.”

### Earth Genome, Senior Associate

2022 – 2023

- Led the development of the [Earth Index](#), a search tool for satellite imagery, powered by (1) information-rich embeddings calculated on satellite imagery tiles, and (2) a database for fast retrieval of nearest neighbors.
- Developed a user interface that allows users to click a location, instantly returning areas that most closely resemble the input. Select applications:
  - Detected newly mined areas in the Amazon Basin to support Amazon Mining Watch and the Pulitzer Center.
  - Mapped open-waste sewage pools in Alabama to support environmental justice programs sponsored by the U.S. government.
  - Identified destroyed villages in Myanmar due to ethnic violence in the ongoing Rohingya conflict.

### Earthsight LLC, Self Employed

2020 – 2023

- Founded a consulting firm specializing in geospatial analysis and data visualization. Selected clients:
  - *SkyTruth* - developed algorithms to (1) identify oil slicks in the ocean using radar satellite imagery, and (2) associate slick detections with vessels that may have been responsible.
  - *Impact Observatory* - led the model development for the first iteration of [ESRI Landcover](#), a global land use map derived from Sentinel-2 satellite imagery.
  - *Earthrise Media* - implemented core components of the model pipeline for [Global Plastic Watch](#), a system that identifies plastic waste sites from Sentinel-2 satellite imagery.
  - *The New York Times* - built data and visualization pipelines for multiple stories that utilized earth observation data.

### Descartes Labs, Applied Scientist

2018 - 2020

- Architected an earth observation pipeline that utilized multispectral and radar satellite imagery to monitor oil gas activity in the Permian Basin.
- Mapped the growth of ex-urban areas in the U.S. over a decade by training a deep learning model that detected impervious surfaces from Landsat imagery.
- Tracked the decrease in pollution over cities across the globe during the COVID-19 pandemic using Sentinel 5P satellite data.
- Developed software tools for journalists to rapidly access satellite imagery using the Descartes Labs platform.

### Kickview Corporation, Research Engineer

2017 - 2018

### BAE Systems, Signal Processing Engineer, Senior Principal Research Engineer

2011 - 2012, 2014 - 2017

### BIT Systems, Signal Processing Engineer

2012 - 2014

## EDUCATION

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### University of Southern California, M.S. Electrical Engineering

May, 2015

### The Cooper Union for the Advancement of Science and Art, B.E. Electrical Engineering

May, 2011

## SKILLS

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**Programming:** Python, C/C++, MATLAB, Git, Google Cloud, Amazon Web Services

**GIS:** GDAL, Google Earth Engine, Leaflet, Mapshaper, QGIS, PostGIS

## ACADEMIC PUBLICATIONS

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- “[Satellite monitoring of terrestrial plastic waste](#)”, Kruse et al, *PLOS ONE*, Jan 18 2023
- “[Global land use/land cover with Sentinel 2 and deep learning](#)”, Karra et al., *IEEE IGARSS*, Jul 11 2021
- “[Modulation recognition using hierarchical deep neural networks](#)”, Karra et al., *IEEE DySpan*, Mar 6 2017

## PATENTS

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- “[Systems and methods to categorize mapping categories of pixels](#)”, Filed by Impact Observatory, Dec 29 2020
- “[Automated RF Dataset Creation](#)”, Filed by KickView Corporation, Jun 16 2020

## SELECTED MEDIA

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### Bylines (Freelance)

- “[A Vivid View of Extreme Weather: Temperature Records in the U.S. in 2021](#)”, *The New York Times*, Jan 11 2022
- “[The True Colors of America’s Political Spectrum are Gray and Green](#)”, *The New York Times*, Sep 2 2020

### Graphics (while at Descartes Labs)

- “[How coronavirus stalled climate change momentum](#)”, *Financial Times*, Apr 13 2020
- “[Mexico is illegally destroying protected mangrove trees to build an oil refinery](#)”, *Quartz*, Mar 6 2020
- “[Newly released satellite data reveals the pattern of record warmth in 2019](#)”, *The Washington Post*, Jan 29 2020
- “[A Decade of Urban Transformation, Seen From Above](#)”, *The New York Times*, Dec 27 2019
- “[The U.S. cranberry harvest explained in four charts](#)”, *National Geographic*, Nov 27 2019
- “[Fantastic fall foliage and where to find it](#)”, *The Washington Post*, Oct 9 2019
- “[The Bahamas, Before and After Hurricane Dorian](#)”, *The New York Times*, Sep 5 2019