frank **burkholder**

data scientist

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✚ employment

Galvanize
Denver, CO
Data Science Fellow
Feb 2016 to Current

- Completing 3 month Data Science Immersive program that focuses on python, SQL, statistics, machine learning, natural language processing, neural nets, Spark, and AWS.
- Capstone project investigates UAV package delivery for Denver area.

Abengoa Solar
Lakewood, CO
Manager Research & Development
2012 to 2015

- Responsible for strategic vision, R&D budgets, and research proposals. Authored and awarded $3 million grant for a novel, low-cost solar collector and managed staff of 6 to meet design specifications and Department of Energy deliverables.
- Derived and validated a learning heliostat tracking algorithm to maintain the center of the reflected beam within 1 m of the desired aimpoint located on a target 1 km away.

National Renewable Energy Laboratory
Golden, CO
Mechanical Engineer IV
2006 to 2012

- Ph.D. determined noble gas concentrations necessary to limit heat loss caused by hydrogen permeation into the annuli of parabolic trough receivers. Monte Carlo simulation aided by Latin Hypercube Sampling predicted distinct molecular trajectories while minimizing the number of runs required for statistically significant results.
- Derived and implemented ray-tracing codes for solar flux predictions while developing convolution-based models for generalized design documents.

✚ awards

Department of Energy ·
Drop-in helisotat for rapid installation in solar collector fields
2015

Authored and awarded this $3 million contract by DOE as a next generation step in solar collector technology.

R&D 100 · Skyfuel SkyTrough Solar Collector
2009

Partnership between Skyfuel and NREL helped produce this award-winning, novel collector. I supplied optical modeling and testing expertise.

American Society of Mechanical Engineers ·
Outstanding Graduate Student Award in Solar Energy
2007

✚ technical writing

Heat Loss Testing of Schott's 2008 PTR70 Parabolic Trough Receiver
http://www.nrel.gov/csp/troughnet/pdfs/45633.pdf

Aerial Distant Observer for Rapid Analysis of Solar Collector Fields
http://www.nrel.gov/docs/fy09osti/44332.pdf

✚ volunteering

Peace Corps - Namibia, Africa · High School Teacher
2000 to 2002

- Taught math and science to Namibian students while helping teachers and administrators to secure school improvement funds.
- Lived in a rural homestead with a Namibian family and learned Oshiwambo.

✚ education

Galvanize
Data Scientist Certification 2016

University of Colorado - Boulder
Ph.D. Civil Engineering 2011

University of Wisconsin - Madison
M.S. Mechanical Engineering 2004

Stanford University
B.S. Mechanical Engineering 1995
B.S. Biology 1995

✚ projects

UAV package delivery for Denver

Though technical (Amazon, Google, NASA) and regulatory (FAA) agencies continue investigating unmanned aerial vehicles (UAVs) for home package delivery, no public model exists that quantifies the effect of policy decisions on UAV requirements and delivery service. This DSI capstone project addresses this by developing a model specific to the Denver metro area.

GIS information scraped from the web is integrated with US Census and Denver Open Data in a Mongo database. Graphical analysis plots delivery routes from Commerce City to home addresses. The number and radii of no-fly-zones associated with skyscrapers, heliports, government buildings, schools, and police and fire stations are varied to estimate delivery metrics for lightly and highly constrained delivery scenarios. Landing zones near homes are identified from aerial images using a random forest classifier.

✚ skills

PROGRAMMING: Python, C++, Javascript, Vim, FORTRAN
ANALYSIS: SciPy, SciKit Learn & Image, Beautiful Soup, Matlab, Octave, Excel
DATABASES: SQL, Mongo
OPERATING SYSTEMS: Linux, Windows