# **MUKESH** MITHRAKUMAR

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## Experience

***FOUNDER and MACHINE LEARNING ENGINEER*** September 2018 – Current
ADhiraiyan AI Solutions San Francisco, CA

- Designed and deployed multiple end to end Machine Learning models for early-stage startups.
    - Built a scalable web app where you can Search and Summarize research papers, ask questions about the paper and get answers through a Chatbot using HTML5, CSS3 and JavaScript for frontend, node.js and python for backend, S3 for storage, API Gateway to route traffic, ElasticBeanstalk for load balancing, Lambda functions for preprocessing, SageMaker for hosting the BERT summarizer and AWS Lex for the chatbot.
    - Deployed a BigGAN model as a web app using HTML 5, CSS 3, JavaScript for front-end, Node.js for backend, TensorFlow for machine learning using Python for a client from the entertainment industry.
    - Deployed in AWS using Lambda and Elastic Beanstalk an Object Detection API to detect various grades of cardboard for a recycling company.
    - Led the team that built a Multi-lingual proof of concept Optical Character Recognition mobile app for low resource languages (Tamil & Sinhala) for a bank in Sri Lanka for automatic check deposit.
    - To track and monitor on time medication intake, built an Object Detection API to detect the presence of pills in a mobile screen capture for a healthcare startup using Python and C/C++ extensions.
- Advised founders, product managers and data scientists on framing machine learning problems within the business context and optimize for critical business metrics.

***DATA SCIENCE MENTOR*** December 2018 – Current
Thinkful & Springboard San Francisco, CA

- Mentor and coach mid-career professionals participating in Thinkful & Springboards' Data Science Program on technical topics, approaches, best practices in data science and fundamental software engineering principles.

***MACHINE LEARNING ENGINEER*** May 2018 – November 2018
Data Science Retreat San Francisco, CA

- Led the team that developed an open source end to end object segmentation software package using PyTorch to assist radiologists in the evaluation of lesions in CT and MRI scans for multiple organs.

***ELECTRICAL DESIGN ENGINEER*** January 2017 – January 2018
Bobcat Company Brookings, SD

- Provided engineering support including documentation, design, prototype, test, supplier interfaces and manufacturing for next generation compact loaders that led to an increase in net profit by $87 million.
- Created, managed and maintained CAD models and drawing documentations for Electrical systems.
- Provided Controller Area Networks (CAN) programming, troubleshooting and support to prototype assembly and manufacturing through root analysis.

***PHYSICS TEACHING ASSISTANT*** August 2015 – January 2017
South Dakota State University Brookings, SD

- Directed recitation sessions on concepts of Mechanics, Thermodynamics, Electricity and Magnetism in simpler terms and clarified doubts to help students grasp concepts.

***COMPUTATIONAL RESEARCH ASSISTANT*** August 2015 – January 2017
South Dakota State University Brookings, SD

- Synthesized a novel magnetic material, analyzed efficiency and tested electronic properties of the material that led to a Journal paper in Applied Physics.
- Implemented a multi-layer perceptron in FPGA using Verilog.
- Fabricated a novel thin film Perovskite solar cell with 10.5% efficiency for a grant by NSF.

## Education

***M.S. IN DATA SCIENCE & MACHINE LEARNING, Non-Degree Seeking Student*** | Imperial College London and HSE |

Courses | Machine Learning, Deep Learning, Mathematics for Machine Learning, Computer Vision, Natural Language Processing

***B.S. IN PHYSICS, emphasis Electrical Engineering*** | SOUTH DAKOTA STATE UNIVERSITY | 2018

Courses | Intro to Embedded Systems, Linear Circuit Analysis, Digital Systems, Quantum Mechanics, Automatic Controls, Mathematical Physics, Intro to Flights, Thermodynamics, Advanced Engineering Mathematics, Intro to Logic, Electromagnetism, Solid State Physics, Linear Algebra, Scientific Computation, Algorithms.

Certifications | Machine Learning with TensorFlow on Google Cloud, ***Google***.
Data Engineering on Google Cloud Platform, ***Google***.
Deploying Scalable Machine Learning for Data Science, ***LinkedIn.***
AWS Essential Training for Architects, ***Amazon Web Services.***

Awards | Certificate of Excellence for Outstanding participation in the Undergraduate Research 2016.
Robert H. and Alverda M. Lynch Memorial Scholarship 2016 and 2017.
Walder Sippel Memorial Scholarship 2016 and 2017.

## Projects (Available in GitHub)

***TensorFlow Scientific***

- Built and manage a TensorFlow Scientific library for scientific computing in collaboration with the TensorFlow 2.0 team.

***Google AI Open Images – Object Detection (Kaggle Top 100 – Bronze Medal)***

- Modified a RetinaNet package for Object Detection by training over 17 million images in Google Cloud.

***Google AI Open Images – Visual Relationship (Kaggle Top 100 – Bronze Medal)***

- Implemented a Random Forest Classifier and Multi Output Classifier from SciKit-Learn and experimented with LSTM for Visual Relationship identification in Google Cloud.

***Statoil/C-CORE Iceberg Classifier (Kaggle Top 16%)***

- Built an ensemble convolutional neural network to identify a ship or an iceberg from a remotely sensed satellite using TensorFlow, OpenCV, SciKit and Keras for a Log Loss of 0.1574.

***Hacker Earth Challenge (Top 3%)***

- Built an ensemble convolutional neural network to identify a ship or an iceberg from a remotely sensed satellite using TensorFlow, OpenCV, SciKit and Keras for a Log Loss of 0.1574

***Hacker Earth Challenge (Top 6%)***

- Used classification models (Decision trees) to predict whether an ad will get clicked or not for 72% accuracy.

## Skills

- ***Programming Languages***- {Python} (expert), {Java, C, C++, JavaScript, SQL} (proficient), {Shell} (familiar).
- ***Deep Learning Frameworks***- {TensorFlow, PyTorch, Keras, Pandas} (expert), {OpenCV} (familiar).
- ***Machine Learning Frameworks*** – {SciKit-Learn, NumPy, SciPy} (expert).
- ***Database Management***- {PySpark} (proficient), {Hadoop, MongoDB, Google BigQuery, db2} (familiar).
- ***Cloud Computing***- {Amazon Web Services} (expert), {docker} (proficient), {Google Cloud Platform} (familiar).
- ***Web Development***- {Flask, HTML, CSS, jQuery, Node.js} (proficient).
- ***Software Skills***- Lean, Agile.

## Publication and Publication

***JOURNAL ARTICLE (PEER REVIEWED)***

- Y. Jin, P. Kharel, P. Lukashev, S. Valloppilly, B. Staten, J. Herran, I. Tutic, **M. Mithrakumar, B.** Bhusal, A. O'Connell, K. Yang, Y. Huh, R. Skomski and D. J. Sellmyer. "Magnetism and electronic structure of CoFeCrX (X = Si, Ge) Heusler alloys". *Journal of Applied Physics 2016; (Vol.120, Issue 5).*

***ABSTRACTS***

- **M. Mithrakumar,** B. Bhusal, Y. Huh and P. Kharel. "Tuning Magnetic Properties of $Co_2FeGe$ with Cr Substitution for Fe", *South Dakota Academy of Science 2016. Poster presentation.*

***PRESENTATIONS***

- **M. Mithrakumar.** "Synthesis, Structure and Magnetism of Co2Fe1-xCrxGe (x = 0,0.25,0.5) alloy", *Undergraduate Research, Scholarship and Creative Activity Day 2016.*