

# SUSHIL THAPA

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## EXPERIENCE

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### Graduate Research Assistant

Jan 2021 – Present

New Mexico Tech+Los Alamos National Lab, New Mexico, USA

- Applying interpretable Machine Learning in Health and cancer genomics
- Exploring large scale multi-label text classification based on Transformers
- Exploring multidimensional mode-connectivity and analysis of loss landscapes of deep neural networks.

### Senior Machine Learning Engineer – Team Lead

Jan 2020 – Dec 2020

### Machine Learning Engineer

Sep 2017 – Dec 2019

Fusemachines Inc., New York, USA.

- Lead Fusemachines AI Education curriculum and content development teams, Co-responsible for ideating, executing and refining 4 courses: Deep Learning, Computer Vision, NLP and Reinforcement Learning.
- Design, build and launch efficient and reliable models, pipelines for solving Enterprise-level problems with ML.
- Co-responsible in hiring and scaling team from 6 people to 60+ ML Engineers, managed and provided in-house training, workshops, mentorship and organized paper reading sessions on Deep Learning.

### Deep Learning(/ML) Instructor – AI Microdegree<sup>TM</sup> Program < [www.fuse.ai](http://www.fuse.ai) >

Sep 2019 – Jul 2020

Fuse AI School, Kathmandu, Nepal.

- Teach Deep Learning topics like Neuralnets, CNN, RNN, VAE, GAN, RL, etc. in fuse.ai Education initiative.
- Conduct on-site practical coding sessions on ML/DL algorithms (class of 25 students each)

### Research&Development Engineer – Artificial Intelligence

Jan 2017 – Sep 2017

Spark Tech Pvt. Ltd., Kathmandu, Nepal.

- Research and development on ML solutions related to Image Processing, Audio Analysis, and Internet Of Things
- Investigate, prototype, and refine algorithms in computer vision and deep learning applications as directed.

## EDUCATION

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### New Mexico Institute of Mining and Technology • New Mexico • USA

Jan 2021 – Present

*Master's of Science • Computer Science • Focus: Machine Learning*

### Tribhuvan University • Institute of Engineering • Kathmandu, Nepal

Attended 2012 – 2016

*Bachelor of Engineering • Electronics & Communication Engineering • Focus: Robotics & AI*

## SKILLS

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- Programming languages: Python(preferred), C/C++
- Tools: PyTorch, Keras, Jax(Flax/Haiku), TensorFlow2.0, Numpy, Pandas, Matplotlib, OpenCV, Scikit-learn
- Familiar with:  $\LaTeX$ , Linux, Git, AWS, GCP, Agile

## PUBLICATION

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- An Effective Baseline for Robustness to Distributional Shift. Preprint: (<https://arxiv.org/abs/2105.07107>)

## MACHINE LEARNING SUMMER SCHOOLS

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- Eastern European Machine Learning Summer School(EEML), July 2021.
  - Our project proposal awarded with Deepmind mentorship towards a paper.
  - Topic: Sample efficient Reinforcement Learning using Self supervised Learning and Human Priors
- Neuromatch Deep Learning Summer School(NMA-DL), August 2021.
- Machine Learning Summer School(MLSS Taipei), August 2021.
- Gaussian Process Summer School(GPSS), September 2021.

## FELLOWSHIPS

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- Stanford University Sebastian Thrun Lab Apprenticeship, July 2021 - Present.
- Fatima Al-Fihri Predoctoral Fellowship 2021
- AI Fellowship 2017, Fusemachines Inc.
- Merit-based Engineering Scholarship 2013, Ministry of General Affairs, Nepal

**Google DSC Lead** – Google Developers Jul 2021 – Present  
New Mexico Tech, Socorro, NM.

- Established a Google recognized student club in the university, identify local partners to work with and lead project building activities.
- Expose students on Google Developer products and platforms through hands-on workshops and events.

**Robotics Engineer** – Robotics and Automation Center Nov 2014 – Feb 2016  
Institute of Engineering, Kathmandu, Nepal.

- Build theme-based robots to compete in various national and international Robotics Competitions.
- Conducted institution-wide seminars and training sessions related to Robotics, Automation, and AI.
- *Awards:*
  - Country Winner, Represented Nepal in International Robotics Challenge(IRC) in Asia's Largest Science and Technology festival i.e. Techfest 2015, IIT Bombay, India.
  - Finalist, Step-up Competition in Asia's Largest Techno-Management Fest i.e. Kshitij 2014, IIT Kharagpur, India.

### Mentorship

- Founder/Mentor, New Mexico Tech Artificial Intelligence Group, Jun 2021-Present.
- Mentor, Community Volunteer at DN: AI Developers Nepal, 2018 - 2021.
- Facilitator/Mentor, Fusemachines AI Fellowship 2018, 2019.

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### PROJECTS

**Object Detection System** – Video Intent Classification Dec 2019 - Apr 2020  
*Fusemachines Nepal*

- Apply multiple object detection algorithms on custom annotated dataset and perform their accuracy-latency trade-off analysis.
- Applied Edge-computing to deploy appropriate models on GPU IOT devices like Jetson Nano.

**Image Captioning Project** – Microsoft COCO Challenge Oct 2017 - Apr 2018  
*Fusemachines Research*

- Research and experiment on building state-of-the-art image captioning models based on SCST paper (Rennie et. al, CVPR-2016) and its evolution with its author for MSCOCO Caption Challenge.

**Fuse Extract** – Optical/Intelligent Character Recognition Dec 2018 - Aug 2019  
*Fusemachines Nepal Pvt. Ltd.*

- Built data collection pipeline, image processing pipeline for Image Registration and ROI extraction.
- Developed and experimented with Convolutional and Recurrent DL models to extract information from images.

**Rectif.ai** – Posture Recognition System Aug 2019 - Oct 2019  
*Global Pytorch Hackathon 2019*

- Applied MobileNet based Posenet model for detection of different body keypoints & notify if the detected pose seems appropriate or not by classifying the keypoint locations.
- Opensourced: pip install rectif-ai

**Hawaiian-ASR** – Automatic Speech Recognition Aug 2018 - Aug 2019  
*Dr. Lipyeow Lim, University of Hawaii at Mānoa*

- Built an entire Hawaiian ASR dataset collection and pre-processing pipeline with forced-alignment.
- Development of State of the Art Hawaiian ASR model and applied translation algorithms for converting missionary to modern orthography.

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### ONLINE ML COURSES & CERTIFICATIONS (WITH LINKS)

- edX: AI MicroMasters Program (1+ Year, Certified with Proctored Exam, credit eligible in Columbia University)
  - 1. Artificial Intelligence, 2. Machine Learning
- Machine Learning by Andrew Ng (Coursera, 11 weeks)
- Neural Networks for Machine Learning by Geoffrey Hinton, UofT (Coursera, 16 Weeks)
- Natural Language Processing by University of Michigan (Coursera, 12 Weeks)
- Udacity: 1. Deep Reinforcement Learning Nanodegree, 2. Computer Vision Nanodegree