# Joel Joseph

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## EXPERIENCE

### Innoplexus Consulting Services, Pune — *Associate Data Scientist*

September 2021 - PRESENT

- Developed novel solutions to drug development problems using GPT2, BERT and other NLP models/techniques.
- Submitted a novel deep learning based solution for a client delivery project.
- Worked on Data Extraction from PDFs using Camelot-py, Tabula, NLTK, Stanza (Stanford NLP) taggers, etc.
- Used ElasticSearch, etc. for working with databases.

### AUV-IITBHU, Varanasi — *Computer Vision Developer*

August 2018 - September 2020

- Worked with non-deep learning based Object Detection techniques in OpenCV such as edge detection.
- Led the Computer Vision team in developing the code framework for Object Detection and Localization on Underwater Images using Facebook AI's Detectron2 package written in PyTorch. The results helped the group in getting more funding from the Inter-IIT Board.
- We used the Image Detection part of MaskRCNN initially and later shifted to FastRCNN for faster detection. Github

## EDUCATION

### Indian Institute of Technology (BHU), Varanasi — *BTech in Mechanical Engineering*

2017 - 2021

- CGPA: 7.83
- Had fun with friends and some projects :)

## SKILLS

### LANGUAGES

Python, C++, SQL, Javascript, MATLAB

### TECHNOLOGIES

PyTorch, Tensorflow 2.x, Tensorflow 1.x, Sklearn, Matplotlib, Seaborn, Numpy, Pandas

## AWARDS

### WandB Reproducibility Grant 2021

Received a grant amount of *$500* for successfully reproducing a NeurIPS paper and publishing a report of the analysis.

### JEE Advanced 2017

Top 1 percentile among 0.1 million candidates

## CERTIFICATIONS

*Deep Learning Specialization* - Coursera

*Fundamentals of Reinforcement Learning* - Coursera

## LANGUAGES

English, Hindi, Malayalam

### Pixelate — *Autonomous Vehicle Development*

Jan 2018 – Mar 2018

- The Pixelate competition part of the annual Institute TechFest involved developing an autonomous bot which can navigate a maze using input from an overhead camera.
- I developed code for object detection, localization and navigation in MATLAB without the use of Machine Learning techniques (as per the rules).

### BTech Project — *Damage Detection in Structures using Artificial Intelligence*

Nov 2019 – May 2020

- During the course of 6 months we developed a theoretical framework for the detection and quantization of cracks in metallic/non-metallic structures by processing the input from Laser Sensor using simple Neural Networks

### Open-Source Contribution — *Contributed to machine learning package mlpack*

Jan 2020 – Apr 2020

- mlpack is the most popular C++ Library used for machine learning purposes ranging from Computer Vision to Reinforcement Learning, hosted on Github.
- I wrote documentation, fixed bugs and developed some functions for the Reinforcement Learning part of the library.

### Research Intern — *Mila – Quebec AI Institute*

May 2020 – Jul 2020

- Worked with Dr. Jie Fu (MILA) on coding a novel Meta-Reinforcement Learning solution based on Learnable Neural Optimizers.
- Read research papers and implementations on Github for developing the code.

### IEEE Cog 2021 Competition — *Developed an RL model to compete*

Sep 2020 – Oct 2020

- Worked on developing a Reinforcement Learning model that can generalize across different levels of the same grid based video game present in the General Video Game AI (GVG-AI) framework.
- I made use of the Stable-Baselines package (PyTorch) for my work.

### Open-Source Contribution — *Contributed to meta learning package learn2learn*

Nov 2021 – Dec 2021

- Contributed example implementation of the Meta-Learning technique called MAML (Model Agnostic Meta Learning) on toy datasets. Pull Request (Github)

## PUBLICATIONS

### Automated diagnosis of Tuberculosis from Chest X-Ray Screening using Deep Network Architecture and Visualization — *Elsevier (Under Review) – Sandhya V (PES-IT), Joel Joseph (IIT BHU), Ansh Gupta (IIT Kanpur)*

- In this paper, we explore the use of small/light CNN architectures to get SOTA accuracy in tuberculosis detection, enabling the use of deep learning in mobile settings where compute power is limited.

### Reproducibility Report: La-MAML: Look-ahead Meta Learning for Continual Learning — *NeurIPS Reproducibility Challenge – Joel Joseph (IIT BHU), Alex Gu (MIT) – Arxiv*

- As part of the 2020 NeurIPS Reproducibility Challenge, we worked on reproducing the output of the La-MAML paper (NeurIPS 2020), a new SOTA in the Continual Learning domain.
- We reproduced the code and did/recorded extensive experimentation on the model to verify the core claims made in the paper. We compiled our findings in a report for peer review in the Re-Science journal.