# Sripad Joshi

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## Education

- **Indiana University** — Bloomington, IN, USA
  *MS in Computer Science* — *Aug. 2021 – present*
- **IFHE Hyderabad** — Hyderabad , India
  *B.tech in Computer Science ; CGPA: 9.55* — *Aug. 2016 – May. 2020*

## Skills

- **Data Science Focus:** Computer Vision, Predictive Analysis, Machine Learning, Deep Learning, Deploying Live Models, Rapid Prototyping, Exploratory Data Analysis, Medical Image Analysis.
- **Programming and tools**: Python, Java, C, MySQL, HTML, CSS, Github, Jupyter, Vscode, Flask
- **Libraries**: numpy, pandas, folium, scikit-learn, opencv, scikit-image, keras(Tensorflow), pytorch, scipy, imblearn, openslide

## Project and Research Experience

- **Onward Assist** — Hyderabad, India
  *Machine Learning Engineer* — *Jan 2020 - July 2021*
  - **Project:** : **Nottingham scoring using AI** - Built an AI tool for Breast Carcinoma grading on whole slide images using computer vision.
    **Contribution:** Trained LinkNet based semantic segmentation model for Mitosis detection. Used Vahadane's approach of stain normalization for better model generalization.
    **Collaborations:** Worked in collaboration with Yale and Cornell medical schools, for the concordance study. Our algorithm achieved metrics on par with 6 pathologists in Breast Carcinoma grading.
    **Publication:** The research project culminated into a paper with acceptance in Archives of Pathology & Laboratory Medicine - CAP
  - **Project:** : **Exercise Repetition counting using pose estimation** - Built an python application to do exercise repetition counting using pose estimation (computer vision).
    **Contribution:** Used pretrained openpose model for pose estimation. For a given exercise, identified the important key-points and used angle or similar properties of the points to do repetition counting.
  - **Project:** : **Masses and Microcalcifications detection in breast mammogram images** - Trained an object detection model to detect masses and micro-calcifications in breast mammogram images.
    **Contribution:** Trained a Resnet50 backbone FasterRcnn model to detect Masses and Micro-calcifications. Used OMI-DB data set for the mammogram images.
    **Deployment:** The model achieved 90% and 92% recall for masses and calcification respectively on the test set. Deployed the tool as a web application using flask framework on radflowDx, online medical image analysis platform by Onward Assist.
  - **Project:** : **Live Mitosis Detection Tool** - Built an live mitosis detection tool to assist pathologists for Mitosis scoring on H & E histopathology images.
    **Contribution:** Trained a UNET semantic segmentation model to detect Mitosis in the H&E stained biopsy images.

**Publication:** Deep Learning Based Mitoses Recognition and Concordance study with Pathologists - Pathvision2020 (poster presentation)

- **Project:** : **Self supervised learning in histopathology** - Leveraged self-supervised learning to the histopathology domain using simCLR model and studied its viability.
  **Contribution:** Trained a simCLR unsupervised model on histopathology dataset Camelyon17. The model performance was on par with that of a supervised trained model. Experiments showed that the unsupervised model performance degraded more in comparison to the supervised model with increase in data imbalance. Working on addressing this issue using class weights obtained from representation clustering.

- **Project:** : **COVID-19 spatio-temporal Analysis** - Built a python based tool for Healthlynked, FL, USA, to perform covid-19 cases forecasting, identifying potential high risk, low risk regions and predicting infection rate.
  **Contribution:** Mapped the entire US land area into 0.5 sq mile grids. Extrapolated the data (covid-19 cases, population count) available at county level to these grids. Trained a model at grid level to forecast covid-19 cases and infection risk. Data sources used were Facebook's Data For Good for the population count at county level and Johns Hopkins Coronavirus Resource Center for Covid-19 cases.

- **South Central Railways** Secunderabad, India
  *Summer Intern* *April 2018 - July 2018*
  - **Indoor Localization**: Worked with a team on a solution for Indoor Localization where we developed an Arduino based robot which moves on a predefined path and tracked its live position using technologies like SITUM.

- **Academic Projects** Hyderabad, India
  *Undergraduate* *August 2016 - June 2020*
  - **Project:** : **Fruit Maturity Stage Detection**
    Implemented a pipeline of object detection and classification to efficiently identify the maturity stage of fruits (Pomegranate) in orchards to aid auto harvesting. Used YOLO v3 for fruit detection.

  - **Project:** : **Youtube video downloader**
    Built a python based tool to download media from youtube. Used pyqt5 for user interface and pytube for media download.

## Certifications

- **Neural Networks and Deep Learning**
  Deeplearning.ai
  **Issued on** : July 2019

- **Machine Learning**
  Coursera
  **Issued on** : November 2018