

# Madhav Thakker

SOFTWARE ENGINEER · IOS DEVELOPER

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## Summary

As a skilled iOS, ML developer, and Cloud Engineer with 3+ years of experience, I specialize in mobile-first deep learning technologies like CoreML, Vision, ONNX, and PyTorch. My interests revolve around creating innovative mobile applications for deep learning solutions, or finding creative solutions to challenging problems in general. And when I'm not coding away, you can find me indulging in a friendly game of chess or pondering the mysteries of finance and economics.

## Work Experience

### VisioLab

Osnabrück, Germany

#### DEEP LEARNING & IOS DEVELOPER

- Led the development for **Blink iPad OS** following MVVM architecture using **SwiftUI**, **UIKit**, **Vision**, and **CoreML**, for automated canteen check-out experience. Made sure to write Unit tests and UI tests for every feature.
- Implemented a CI-CD pipeline using **GitHub actions** and **Fastlane** for seamless TestFlight distribution; reduced costs by using self-runners. Ultimately moved to Xcode cloud.
- Proposed and developed an active-learning pipeline to learn from failures. Created an MVP iOS app using **On-Device-Training** to automate the process of adding new food classes & improving previous ones.
- Used **PyTorch** to train Faster-RCNN, YOLOv5, and other deep learning multi-stage approaches to achieve accuracy > 90% with over 100 different food categories.
- VisioLab has successfully completed **500K+** automated checkouts with over **\$2.5 million** in sales.

### MathWorks

Hyderabad, India (Virtual)

#### CLOUD PLATFORMS ENGINEER

- Integrated MATLAB with **Amazon SageMaker** utilizing a Dockerized approach to run MATLAB in a Jupyter environment. Demonstrated the advantages of spot training and parallel hyperparameter tuning. Created a Jupyter notebook that was consumed and shared by AWS in their tutorials.
- Maintained & Released **MATLAB reference architecture** for Amazon and Azure cloud for MATLAB versions R2021b & R2022a. Developed an open-source MVP for MATLAB on Linux for **Google Cloud** using **Packer** and **Terraform** technologies.
- Implemented deep learning solutions for Lane Detection in MATLAB. Used Iterative Labelling to annotate raw images with minimal human help.

### PureStrength

London, UK (Virtual)

#### CTO

- Single-handedly developed, maintained, released and optimised the **PureStrength iOS app** with > 4.9★, and it's corresponding **AWS & Fire-base** cloud backends.
- Trained **DensePose** and YOLO deep learning models using PyTorch to track barbell weights in gym, then converted the models for mobile use using **Torchscript** and **Coremltools**.
- Worked on low-level **Objective-C bridging** to run custom Torchscript models such as DensePose on iOS devices. Created **animations** for human contour plotting using Swift and optimized C++ wrappers for CV2.
- Wrote non-trivial analysis to calculate velocity, Range of Motion using barbell weight trajectories, and optimized the inference procedure by **multi-threading** and using parallel queues, reducing inference time by 70%.

### IIIT-Delhi

Delhi, India

#### BEE MONITORING (UNDERGRAD THESIS)

- Used PyTorch to train a Mask-RCNN, Faster-RCNN, **Domain Adaptive Faster-RCNN** to count the number of bees in beehive images frames.
- Proposed a novel Domain-Adaptive SSD with *multi-level domain-adaptation* to work with bees of different sizes and colors.
- Verified the generalizability of proposed method by running experiments on standard domain-adaptive datasets.

## Leadership & Awards

2021 **Bash Lead**, Mentored 15 EDG Engineers during the biannual company wide bash.

Hyderabad, India

2020 **Teaching Assistant**, Deep Learning & Game Theory Courses

Osnabrück & Delhi

2016 **School Rank - 1**, CBSE Class XII Exams

Delhi, India

## Skills

Cloud	Azure, AWS, GCP, Xcode Cloud, Docker, Fastlane, GitHub actions
iOS Technologies	CoreML, Vision, ARKit, AVKit, SwiftUI, UIKit, AVFoundation, CocoaPods
Back-end	Go, Flask, Celery
Programming	Python, Swift, React Native, MATLAB, Firebase, Firestore, Firebase Functions, FCM, Crashlytics, Analytics