# Shounak Desai

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## Summary

Machine Learning Engineer with 2+ years of experience of developing scalable AI-driven solutions, advanced data analysis, MLOps frameworks for seamless model integration and delivering measurable business impact, including $800K+ in cost savings. Research experience of 2+ years in advancing deep learning methodologies, with expertise in building Generative AI models (VAEs, GANs, DDPM), deploying Computer Vision systems, and designing end-to-end data pipelines.

## Education

**Rochester Institute of Technology** — Rochester, NY
*Master of Science in Computer Science (Specialization: Artificial Intelligence)* — *August 2022 - March 2025*

**Pune Institute of Computer Technology (PICT)** — Pune, India
*Bachelor of Engineering in Electronics and Telecommunications* — *June 2016 – May 2020*

## Work Experience

**Research Assistant** — May 2023 - Present
*Computational Biomedicine Lab - RIT* — *Rochester, NY*

- Engineered a Domain Adversarial Neural Network (DANN) using PyTorch on simulated and clinical ECG datasets, achieving a **58% accuracy**—a substantial improvement over the 30% baseline for Arrhythmia detection

**Machine Learning Engineer** — August 2020 - July 2022
*Vodafone Intelligent Solutions (VoIS - Vodafone Group)* — *Pune, India*

- Designed and implemented **end-to-end ML Automation pipelines** using Scikit-Learn, Docker, GCP tools, and Apache Airflow, advancing MLOps practices within the team
- Constructed ETL pipelines and applied AI/ML models with statistical analysis using Python, Pandas, and Apache Spark for large-scale data processing
- Optimized GCP service utilization by strategically advising on cost-effective solutions for 3+ GCP projects, enhancing the department's cloud efficiency

## Projects

**Offside detection in Soccer using Single Camera** | *Python, OpenCV, PyTorch* — April 2024

- Pioneered a novel offside detection system utilizing a single camera, reducing the need for 10-30 traditional cameras by **90-97%**, thereby lowering hardware costs and complexity **Github**
- Leveraged pre-trained model for precise **Keypose Estimation**, employing vanishing point techniques to construct accurate 3D offside lines using Hough Lines in 3D space

**SOX Compliance Tickets Automation Pipeline** | *NLP, GCP, Apache Airflow* — March 2022

- Led the automation of the work of 25-30 full-time employees at Vodafone Group, **saving $350k-$800k** in revenue by developing an end-to-end binary classification NLP pipeline
- Deployed the XGBoost NLP model on GCP Cloud Composer utilizing Scikit-Learn, Apache Airflow and Google Cloud Storage delivering an end-to-end automation pipeline with **88% accuracy**

**OCR based File extraction API** | *Python, PostgreSQL, Flask, Docker, Tesseract* — May 2021

- Collaborated to developing a Flask API that used **Tesseract OCR** to extract data from business PDFs, generated CSV outputs, and integrated SQL queries with **PostgreSQL** for 4 international markets
- Automated the manual process of extracting information from contracts, deploying the solution on SAP Cloud Platform using Docker, **saving $100k+** for Vodafone

## Technical Skills

**Languages and Tools**: Python, Java, C++, R, Shell scripting; SQL, NoSQL, PostgreSQL, MongoDB, Apache Spark
**ML Frameworks & Libraries**: PyTorch, TensorFlow, Scikit-Learn, Numpy, Pandas, Matplotlib, NLTK, OpenCV
**Cloud & DevOps Tools**: Google Cloud Platform (GCP), MLFlow, Apache Airflow, Docker, Flask, Git; Generative AI expertise in VAEs, GANs, and Diffusion Models