PRADIPTA DEB

Research and Development Engineer

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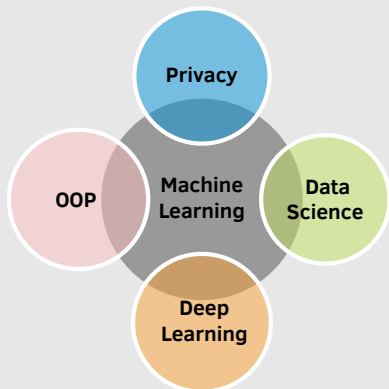
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Technical Skills ——

Overview

Privacy · Machine Learning · Data Science · OOP · Deep Learning

Skills

Python • C

Keras • Fastai

Tensorflow • Pytorch

Numpy • Pandas • Scikit-learn

Gradle • Git • LaTeX

SQL • MYSQL • Flask

C++ • R • Java

Rust • Julia

About Me

I'm skilled in the development and implementation of various statistical machine learning algorithms in various programming languages and frameworks. I have a strong research inclination towards the application of deep neural networks, machine learning in the domains of computer vision, natural language processing, speech applications, medical or healthcare applications with emphasis on user data privacy. I am very keen to take new challenges with greater responsibilities. I am a quick learner and can adapt to a new environment, new work culture, and a dynamic team structure. I'm looking for an opportunity where I can put my knowledge and experience into good use and at the same time learn new things every day during this process.

Experience

Oct 2019 - Present

Research and Development Engineer   Team Magnet, INRIA, France

- In this team, I focus on developing privacy-preserving machine learning models, unit testing, integration testing, and performance tuning specifically for deployment in low-resource devices.

- **Project Details**:
  1. **Collaborative Computation Platform**: The work for this project mainly involves creating a computation platform, where users can send their data for participating in a collaborative statistical study without having to think about the privacy of their data. The platform performs some U-statistics on gathered user data and securing the platform from any adversarial attack utilizing concepts and algorithms from the fields of Differential Privacy, Homomorphic Encryption, and complete Decentralized Learning.
  2. **Privacy Specification Language**: For the second project I am collaborating with a Ph.D. student on developing a new language that can mention the privacy constraint of a contract. This language supports all functionalities of a typical OOP language along with the possibility of performing probabilistic analysis of data privacy and data provenance.

  Tools: Jupyter Lab, Docker, Anaconda, Python, Flask

Sep 2019 - Oct 2019

External Collaborator   Team Magnet, INRIA, France

During this short collaboration, I worked on implementing and integrating the **GOPA algorithm** into an existing privacy-preserving averaging platform. This work was done completely in python.

Oct 2016 - Dec 2018

Research Assistant   MLT Lab, DFKI, Germany

- I was part of the Multilinguality and Language Technology lab, during my graduate study in Germany. I worked on improving the grapheme-to-phoneme module of the existing MaryTTS project.

- **Project Details**:
  1. Built a new model for the **Unit-Selection Module** of text to speech synthesis system, which converts phoneme strings into 16bit audio files.
  2. Built a **Neural Grapheme to Phoneme conversion model**. The model was used in the Blizzard-2018 Challange submission from MaryTTS team.

  Tools: Jupyter Lab, Docker, Anaconda, JAVA, Python, Tensorflow, Numpy, Flask Scikit-learn

Education

MS, Computer Science
Saarland University
2015 - 2019 | Saarland, Germany

BTech., Information Technology
West Bengal University of Technology
2008 - 2012 | West Bengal, India

Certificates

- **Coursera|DL.AI - AI for Medicine Specialization 2020**
- **Coursera|DL.AI - AI for Medical Diagnosis 2020**
- **Coursera|DL.AI - AI for Medical Prognosis 2020**
- **Coursera|DL.AI - AI for Medical Treatment 2020**
- **Coursera|Imperial College London - Mathematics for Machine Learning Specialization 2019**
- **Coursera|DL.AI - Deep Learning Specialization 2018**
- **Coursera - Machine Learning 2016**
- **Coursera - Algorithms: Design and Analysis, Part 1 2016**
- **DataCamp - Introduction to R 2017**
- **DataCamp - Intro to Statistics with R 2017**
- **DataCamp - Intermediate R 2017**
- **DataCamp - Python Programming Track 2017**
- **DataCamp - Intermediate Python for Data Science 2017**
- **DataCamp - Deep Learning in Python 2017**
- **DataCamp - Multiple and Logistic Regression 2017**
- **DataCamp - Correlation and Regression** 2017
- **DataCamp - Python Data Science Toolbox (Part 1) 2017**
- **DataCamp - Python Data Science Toolbox (Part 2) 2017**
- **Edx - Stat2.1x: Introduction to Statistics: Descriptive Statistics 2013**
- **Edx - Stat2.2x: Introduction to Statistics: Probability 2013**
- **Edx - Stat2.3x: Introduction to Statistics: Inference 2013**

| Sep 2012 - Sep 2015 | **Systems Engineer** | **Tata Consultancy Services Limited, India** |

- I worked as a system engineer on two separate projects.

- **Projects**:
    1. **Configurable Network Computing Developer**: My prime responsibilities were writing scripts to monitor system performance and production maintenance. I was also in charge of package deployment in Oracle's JD Edwards EnterpriseOne for several instances of the Johnson & Johnson family of companies.
    2. **Java Developer**: I was in charge of leading a team of 3 developers working in the domain of web and system application development. I also provided maintenance support for system applications in testing and production environment.

Tools: JAVA, Python, BASH, C++, MySQL, Oracle-SQL

Research

| Jan 2017 - Jun 2019 | **Graduate Research Assistant** | **M2CI, Saarland University, Germany** |

Thesis: **Multilingual Grapheme-to-Phoneme Conversion**
- Built a novel multilingual grapheme-to-phoneme conversion system that was able to perform state-of-the-art performance compared to similar research in this domain. During the work, I proposed a new method to enhance the capabilities of the system by incorporating the phoneme similarity measurement.
- This work was also part of the Text-to-Speech system which was submitted in the Blizzard-2018 challenge.
- **Tools**: Python, Tensorflow, Scikit-learn, Pandas

| Jun 2011 - Jul 2011 | **Undergraduate Research Assistant** | **SNIP, India** |

Topic: **Multidimensional Optimization using Hybridized Particle Swarm and Simulated Annealing Optimization**
- Built a hybridized version of the Particle Swarm and Simulated Annealing Optimization. The performance of this new algorithm was better in terms of time complexity. This work was later published in the International Journal of Information Technology (IJIT) hosted by LILY Research Centre, Nanyang Technological University.
- **Tools**: Python, pandas

| Mar 2011 - May 2011 | **Undergraduate Research Assistant** | **VECC, India** |

Topic: **Statistical analysis of input text of a Sign Language Animator**
- The project requirement was to build a "Word Frequency Statistic" Software as part of a "Sign Language Animator", which was designed to felicitate physically challenged people in understanding language.
- **Tools**: Java, PHP

Publications

1. Le Maguer, S., Steiner, I., Tombini, F., **Deb, P.**, Basu, M., & Kröger, I. (2018). **Agile MaryTTS Architecture for the Blizzard Challenge 2018**.

2. Basu, M., **Deb, P.**, & Garai, G. (2014). **Hybrid of particle swarm optimization and simulated annealing for multidimensional function optimization.** International Journal of Information Technology, 20(1), 112–20.

3. **Deb, P.**, & Basu, M. (2014). **Next Generation Sequencing Using Ant Colony Optimization Algorithm and Binary Particle Swarm Optimizers.** International Journal of Information Technology, 20(1).

4. Banerjee, C., Kundu, A., Basu, M., **Deb, P.**, Nag, D., & Dattagupta, R. (2013). **A service based trust management classifier approach for cloud security**. In 2013 15th International Conference on Advanced Computing Technologies (ICACT) (pp. 1–5).

5. **Deb, P.**, & Basu, M. (2013). **An Analogy of Algorithms for Tagging of Single Nucleotide Polymorphism and Evaluation Through Linkage Disequilibrium** INTERNATIONAL JOURNAL OF COMPUTER ENGINEERING & TECHNOLOGY, 4(4).

6. Basu, M., & **Deb, P.** (2013). **Tag Snp Selection Using Quine-McCluskey Optimization Method** INTERNATIONAL JOURNAL OF ADVANCED RESEARCH IN ENGINEERING AND TECHNOLOGY, 4(5).

Projects

1. **Lung Cancer Detection using CNN** - 2017

2. **Ultrasound Nerve Segmentation using CNN** - 2016

3. **Voicebuilding for Text to Speech Synthesis** - 2016

4. **Evolutionary algorithms in "Tag SNP Selection and DNA Sequencing"** - 2012

5. **Security in Cloud Computing - A Novel Algorithmic Approach** - 2012

Achievements

1. **IEEE International Conference on Advanced Computing Technologies** → Received Best Paper award - 2013

2. **Tata Consultancy Services Limited** → Received Kudos certification for the year - 2012-2013

3. **Government of India** → National Merit Scholarship - 2006

Certificates

- **Edx - CS50x: Introduction to Computer Science I 2013**
- **Edx - 6.00x: Introduction to Computer Science and Programming 2013**

Personal

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06-JUL-1990

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Married

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