Partha Sarathi Purkayastha

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Research Interests

Computer Vision, AI in Healthcare, Human-AI Interaction

Education

2020 – 2024 **B.E. Computer Science**, Birla Institute of Technology and Science, Pilani, India
CGPA: 9.83/10, **Director's Gold Medal Awardee**
Institute Merit Scholarship: Awarded a full tuition waiver for consistently ranking in the **top 1%**.

Relevant Coursework: Data Structures and Algorithms, Object Oriented Programming, Database Systems, Theory of Computation, Operating Systems, Computer Networks, Linear Algebra, Vector Calculus, Probability and Statistics, Discrete Mathematics, Artificial Intelligence, Computer Graphics, Human Computer Interaction

Experience

Jul'24 – Present **Research Fellow**, Microsoft Research India, Bangalore, India.
- Developed a **Privacy Taxonomy** for diverse scenarios, enhancing AI model sensitivity to varied privacy needs. **Curated** a specialized **dataset** for **privacy-preserving summarizations** to improve model tuning.
- Conducted evaluations using **LLMs**, traditional **NLP metrics**, and **Human evaluation** to measure **privacy adherence**, along with overall **summary quality** assessed through metrics such as **consistency**, **relevance** and **coherence**
- Achieved **superior performance** compared to leading baselines like **GPT-4o** in **privacy adherence** while also maintaining **high overall quality**, supported by high **reliability** scores across evaluations.

Supervisor: Dr.Akshay Nambi

Jan'24 – Jul'24 **SWE Intern**, Sprinklr, Gurgaon, India.
- Identified and resolved **memory leaks** using **memlab**, reducing memory usage by **10%**. Implemented **SSR** with **Next.js** and **GraphQL** for dynamic rendering, improving load times by **20%** through end-to-end testing. Enhanced overall system **performance** and **resiliency** by detecting **render blockers** and optimizing code to prevent crashes and errors.

Aug'23 – Jan'24 **Research Intern**, BITS Pilani, Pilani Campus, India.
- Developed a tool for **manual annotation** of Fundus images, identifying lesions such as **soft exudates** and **microaneurysms**, while collaborating with a local hospital to create a **3,000-image dataset**.
- Implemented **image processing** techniques and trained **custom deep learning models** to automate annotation, achieving accuracy and specificity levels **exceeding 80%** in the tool's functionality.

Supervisor: Dr.Sundaresan Raman

May'23 – Aug'23 **SWE Intern**, Uber, Hyderabad, India.
- Developed an **end-to-end application** using **React.js**, **GraphQL**, and **GoLang** to manage **credit types** for **2000+ employees**. Migrated financial data to a **MySQL**-based centralized database for **secure transactions**. Automated integration and end-to-end testing, boosting system reliability and cutting onboarding time by **two months**.

Jan'23 – May'23 **Research Intern**, Mercedes-Benz, Bangalore, India.
- Enhanced **vehicle component design** by training **customized VAE models** for **controlled generation** of designs based on parameters, utilizing a **proprietary dataset** of over **25,000** data points for diverse outputs.
- Optimized product development with an **application-like website**, providing **user-friendly** access to the deployed ML model and facilitating the generation of **custom designs** for company research

Supervisor: Dr.Poonam Goyal

May'22 – Jul'22 **Summer Research Intern**, Jio Platforms, Mumbai, India.
- Utilized **web scraping** to download bulk images based on specific keywords, annotating them and further optimizing the process with a pipeline for **automated** bounding box dataset creation.
- Trained a **customized YOLOv7 model** on diverse datasets, including a proprietary one, achieving over **90%** confidence in successfully distinguishing objects and barriers from humans

Teaching Experience

Jan'23 – Dec'23 **Techniques in Social Research**, BITS Pilani, Teaching Assistant.
Introduced students to foundational research methodologies and assisted them in the analysis of social research projects

Jan'23 – Dec'23 **Introductory Psychology**, BITS Pilani, Teaching Assistant.
Helped students understand key psychological theories and research methods through weekly classes and doubt sessions.

Jan'22 – May'22 **Microprocessors and Interfacing**, BITS Pilani, Teaching Assistant.
Conducted lab sessions on MASM-based assembly programming, guiding students in hands-on interfacing exercises.

Community Activities

Oct'24-Nov'24 **Volunteer**, *Vision Empowerment*, Microsoft Research India, Bangalore, India.
Designed **Braille-based aids** to help **vision-impaired** children in basic **mathematical** learning through **haptic feedback**.

Jan'22 – Dec'22 **Publicity Coordinator**, *Arunodoi*, BITS Pilani, India.
Led the **Media-editing** team for **Arunodoi**, promoting **Northeast India**'s cultural awareness and community engagement.

Nov'21 – Jan'22 **Volunteer**, *Indian Red Cross Society*, BITS Pilani, India.
Volunteered for executing a **two-day long** Blood Donation Camp with **3000+** footfall and **800+** donations

Additional Projects

Jun'24 – Jul'24 **Image Classification using a Vision Transformer**.
- Developed a **Vision Transformer (ViT)** from scratch for advanced **image classification** tasks using the **CIFAR-10** dataset, implementing key components of the **Transformer architecture** including **multi-head self-attention, patch embedding**, and **positional encoding** with **Python** and **PyTorch**.

Oct'23 – Dec'23 **Systemic Diabetic Retinopathy Analysis**.
- Developed a **diabetic retinopathy** analysis portal focused on **systemic factors**. Achieved over **80% accuracy** in model testing through a comparative study using **TabNet** and **DeepForests** across hospitals in **India** and **Hong Kong**.

Supervisor: **Dr.Sundaresan Raman**

Jan'23 – May'23 **Dynamic Third-Person Shooter Game Development**.
- Developed a **3D open-world third-person shooter** game in **C#** with missions, day-night cycles, and inventory. Integrated Blender assets in **Unity**, using **Cinemachine** for immersive animations and cinematic camera views.

Oct'22 – Dec'22 **Advanced Techniques in Breast Cancer Detection**.
- Developed a **CNN-based image classification model** to analyze **mammograms** and distinguish **tumors** from **non-tumorous** masses, further classifying them as **benign** or **malignant**. Applied **data augmentation** and **transfer learning** on **Mini-MIAS** dataset, achieving **high classification accuracy** and explored **feature extraction** for early cancer detection.

Oct'21 – Dec'21 **Text-Based Fake News Classification**.
- Reviewed supervised classification methods to address online **Fake News Detection**, using **Bi-LSTM**, **LSTM**, and **ensemble models**, achieving over **90%** across all evaluation metrics on an online news dataset used.

Supervisor: **Dr.Virendra Singh Nirban**

Skills

Programing	Python, Java, TypeScript/JavaScript, C/C++, GoLang, SQL
Python Libraries	PyTorch, Transformers, Numpy, Pandas, Plotly, OpenCV
Development	Node.js, React.js/Next.js, GraphQL, Tailwind CSS
Tools	LaTeX, GitHub, Postman, Docker, MongoDB