Srikrishna Bhat

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I am a PhD student at the University of Queensland (UQ). My primary interests lie in passive Brain-Computer Interfaces (p-BCIs) and Extended Reality (XR). My project involves building Virtual Reality (VR)-based training systems with Dynamic Difficulty Adjustment (DDA). Specifically, I am interested in designing Machine Learning (ML) and XR-based systems that are empathetic to humans and aid/augment humans rather than serve as a complete replacement for humans. My experiences during my PhD have given me advanced expertise in ML, XR and physiological signals. Additionally, my prior industry experience at IBM has given me expertise building infrastructure needed to train and deploy machine learning models.

Skills

Tools and Languages	Python, Docker, Kubernetes, Scala, C#, Unity, LaTeX, sklearn, xgboost, pytorch
Research skills	Machine Learning, Experiment Design, Quantitative Statistical Analysis
Communication	English, Hindi (fluent), Kannada (fluent)

Employment History

PhD Candidate **Apr 2021 — Current**
The University of Queensland *St Lucia, Queensland, Australia*

- Designed and conducted experiments to create a dataset to detect workload using EEG and EDA signals in a Virtual Reality-based training environment.
- Designed and built a customised Virtual Reality (VR) based training environment that replicates building LEGO^{TM} models using the Unity3D game engine.
- Analysed EEG and EDA signals against psychological parameters like Workload.
- Constructed semi-supervised Machine Learning pipelines combining xgboost and adapt (domain adaptation and transfer learning library) that incorporate existing open-source dataset. This model can be customised to a user's EEG and EDA signals through initial training on a trial task and better handle inter-subject variability. Additionally, it had an accuracy of 89% for cross-subject cross-task binary workload classification.
- Designed and conducted experiments to study the effects of adaptation algorithms that utilised EEG, EDA and performance in VR-based training systems and study their effects on workload and performance. The pipeline and the system design can be expanded to other domains like rehabilitation and mental health where dynamic difficulty adjustment based on psychological parameters like engagement and stress can be used to ensure longer practice periods in VR-based learning environments.
- Casual Academic for Sem 1 2024, 2025 for courses Studio 3 - Proposal, Software Innovation, Digital Prototyping & XR and Digital Health Software Project. As Casual Academic, I am involved in working as an advising and coaching Student Team projects in studio courses where students learn by working on real world problems.

Staff Software Engineer **Jan 2019 — Feb 2022**
IBM India Software Labs *Bangalore, Karnataka, India*

- Migrating IBM Watson Machine Learning (WML) Deployment Service into the on-premises Cloud Pak for Data environment by refactoring the Scala code and redesigning the Kubernetes container setup to provide a more secure deployment environment.
- Implementing WML team spaces feature in the WML Deployment service using Scala and Akka micro-services. This feature was implemented to provide multiple teams with better collaboration operations.
- Worked with clients in troubleshooting model issues and setting up Pytorch, Tensorflow and XGBoost model pipelines in the IBM WML Deployment service to be used as a backend in their applications.

Software Engineer **July 2017 — Jan 2019**
IBM India Software Labs *Bangalore, Karnataka, India*

- Wrote the kubernetes and flask service code for deploying scikit-learn, xgboost, pytorch and tensorflow models. This feature allowed customers to deploy python-based models in the WML Cloud environment.
- Guided interns in the development of batch scoring architecture for WML deployment service for python models using Amazon S3 and IBM Cloud Object Storage to provide capability to query backend Machine Learning (ML) programs with large ML scoring requests.

Project Intern **Jan 2017 — June 2017**
IBM India Software Labs *Bangalore, Karnataka, india*

- Wrote the early code and design of scikit-learn and xgboost model deployment of WML deployment service in Python Flask

Research Intern **May 2016 — July 2016**
National Tsinghua University *Hsinchu, Taiwan*

- Worked on the problem of Automated Theatrical Performance Analysis to detect and rate actions performed by actors using Siamese network for detecting actor poses with the Caffe library for neural networks. Since this was a two month early stages of the project, most of the project time was spent on exploration of algorithms and testing.

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Research Intern — **May 2015 — August 2015**
Siemens Research Technology Centre — *Bangalore, Karnataka*

- Ported architecture of constant-time (O(1)) sorting algorithms from Artificial Neural Networks to Spiking Neural Networks using the CARLsim neurosimulator, written in C

Education

Doctor of Philosophy, Computer Science, *The University of Queensland* — Apr 2021 — Sept 2025 (Expected)

Master of Technology*, Data Science, *International Institute of Information Technology - Bangalore* — Aug 2012 — July 2017
GPA: 3.15/4

Bachelor of Technology*, Data Science, *International Institute of Information Technology - Bangalore* — Aug 2012 — July 2017
GPA: 3.15/4

*This course was a 5-year course combining Bachelor's and Master's degree. Hence the reason for the repetition

Publications

2023 **Bhat, Srikrishna S.**, Chelsea Dobbins, Arindam Dey, and Ojaswa Sharma. "Multi-modal classification of cognitive load in a VR-based training system." In *2023 IEEE International Symposium on Mixed and Augmented Reality (ISMAR)*, pp. 503-512. IEEE Computer Society, 2023.

2017 Haas, Roland E., Dietmar PF Möller, Prateek Bansal, Rahul Ghosh, and **Srikrishna S. Bhat**. "Intrusion detection in connected cars." In *2017 IEEE International Conference on Electro Information Technology (EIT)*, pp. 516-519. IEEE, 2017.DOI: 10.1109/EIT.2017.8053416

2016 Bagchi, Samya, **Srikrishna S. Bhat**, and Atul Kumar. "O (1) time sorting algorithms using spiking neurons." In *2016 International Joint Conference on Neural Networks (IJCNN)*, pp. 1037-1043. IEEE, 2016.

Invited Talks

2025 *Cognitively Adaptive VR Training Using Real-Time Biosignal Feedback*, Knowledge Through Networking & Sharing (KTNS), Queensland Chapter, Human Factors and Ergonomics Society of Australia, August 2025.

Teaching Experience

Teaching Assistant
DECO3800 - Design Computing Studio 3 Proposal
COMP110/COMP7110 - Software Innovation
DECO2300 - Digital Prototyping And Extended Reality
COMP3820 - Digital Health Software Project

Volunteer Activities and Hobbies

Workshop Director, UQ Reality Labs — Jan 2024 — Dec 2024
Conducted 4 workshops over the year, teaching students basics of VR based development in Unity using the OpenXR toolkit.

HDR Student Representative, Human-Centred Computing Unit — July 2023 — Present
Representing Higher Degree by Research (HDR) student concerns to the school. One of the members involved in organising two Symposiums, one on Research Tools used by students in their respective domains and one on prior experience of students who have gone through their PhD Oral examination.

Hobbies: Competitive Gaming (Overwatch 2), Bouldering