R. Sai Prasanna

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Professional Experience

Research Assistant, *Machine Learning Lab, University of Freiburg*   Nov 2023 – present
- Working on creating a scale benchmark and methods to improve Model-based Reinforcement learning algorithms for Zero-shot generalization using Contextual Reinforcement Learning.

Research Assistant, *Robot Learning Lab, University of Freiburg*   Jan 2022 – Oct 2023
- Worked on uncertainty-aware semantic mapping for sample efficient reinforcement learning in embodied indoor navigation in real robots.
- Created new environments and base-policies in NVIDIA Isaac simulator for hierarchical reinforcement learning facilitate mobile manipulation tasks.
- Experiment design, engineering, and research on Model-based Reinforcement learning for cross-embodiment generalization.

Staff Machine Learning Scientist, *Agara Labs*   2021
- Significantly improved the accuracy of a hierarchical text classification system for voice support using large language models, reducing operational time for customer support representatives.

Machine Learning Engineer, *Zoho Corporation*   2017 – 2021
Grammatical Error Correction
- Developed a deep learning-based multi-lingual grammatical and contextual error correction system for Zoho Writer, which has proofread and helped correct millions of user-written sentences.
- Improved the accuracy of the system through the application of semi-supervised learning, data augmentation, architectures with better inductive bias, and transfer learning.
- Scaled model inference through quantization, distillation, and pruning techniques.
- Led the release of a beta model for the Spanish language and initiated active research on adding new languages to assist diverse language writers with proofreading needs.
- Mentored junior engineers to convert research in areas such as fine-grained grammatical error classification to production-ready models.
- Contributed back to open source NLP projects such as AllenNLP and FairSeq.

NLP Suite
- Made critical architecture choices for multiple services in Zoho's NLP suite, such as translation, question answering, and language detection.
- Designed a scalable semantic search system by incorporating advances in approximate nearest neighbours search and semantic vectors from deep neural nets.

Software Engineer, *ManageEngine, Zoho Corporation*   2015 – 2017
- Spearheaded the development of a remote desktop client for the GNU/Linux platform, expanding the platforms that can be remotely managed by users of Desktop Central and Zoho Assist.
- Developed the iOS app for network management and led the team responsible for building the Android app for the same. These apps provided users with secure and easy access to network resources on-the-go, improving their productivity and efficiency.

Publications

When BERT Plays the Lottery, All Tickets Are Winning!, *EMNLP* ⧉   2020
Sai Prasanna, Anna Rogers, Anna Rumshisky
Analyzed pruned sub-networks in BERT in the context of fine-tuning. Used pruning as a novel approach for interpretability.

Zoho at SemEval-2019 Task 9: Semi-supervised domain adaptation using tri-training for suggestion mining, *NAACL* ⧉   2019
Sai Prasanna and Ananda Seelan
Incorporated transfer learning and semi-supervised learning for domain adaptation reaching **third place** in the leaderboard for the domain transfer Subtask (B).

Research Projects

Uncertainty-aware semantic mapping for object search using reinforcement learning, *Master's Project - University of Freiburg*   Jan 2023 – Dec 2023
Modular approaches that learn reinforcement learning policies over semantic maps are effective for object search tasks in indoor environments. Despite successful transfer from simulators to the real-world, perception errors are a notable source of failure. We systematically study various semantic segmentation models and their impact on downstream object search performance.

Augmented Dreams: Data Augmentation & Self-supervised learning in Model-Based Reinforcement Learning,   2022
Deep Learning Lab - University of Freiburg ⧉
Studied the effects of data augmentation and self-supervised learning auxiliary losses for improving sample-efficiency of model-based RL algorithm (Dreamer).

DEHB-WS: Joint Architecture and Hyperparameter Search with Weight Sharing, *AutoML Lab - University of Freiburg* ⧉   2022
Introduced a new method and studied its efficacy for joint architecture and hyperparameter search.

Evaluating Zeroth and First-Order MPC Methods with a World Model, 2022
Neurorobotics Lab - University of Freiburg
Applied Cross Entropy Method and Gradient Descent (CEM-GD) for improving the performance of the PlaNet world model.

Imitation Learning in MPC using Differentiable Convex Optimization, 2023
Systems Control and Optimization Lab - University of Freiburg
Applied differentiable convex optimization to improve imitation learning compared to system identification for model predictive control.

Education

Master of Science - Computer Science, *University of Freiburg* Oct 2021 – present | Freiburg, Germany
Specialization in Artificial Intelligence
Current GPA: **1.2** (scale 1.0-4.0 best-passing)

Bachelor of Engineering - Computer Science, *Anna University* Jun 2011 – Apr 2015 | Chennai
CGPA: 8.24/10.0

Skills

Research Areas
Model based Reinforcement Learning, Robotics, Transfer Learning, NLP

Relevant Courses
Reinforcement Learning, Deep Learning, Optimal Control, AutoML

Programming Languages
Python, Swift, Javascript, Go, Rust

Libraries/Frameworks
Pytorch, NVIDIA Isaac Sim, Stablebaselines, AllenNLP