

# Sai Prasanna R.

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## Professional Experience

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**Research Assistant, Machine Learning Lab, University of Freiburg** Nov 2023 – present

- Research on world models for Zero-shot generalization using Contextual Reinforcement Learning.
- Working on evaluating world model architectures with partial observability and stochasticity.

**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

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**Dreaming of Many Worlds: Learning Contextual World Models Aids** 2024

**Zero-Shot Generalization, Accepted to RLC 2024** [🔗](#)

Sai Prasanna, Karim Farid, Raghu Rajan, André Biedenkapp

We introduce the contextual recurrent state-space model (cRSSM) that incorporates contextual information and enhances the zero-shot generalization of world models to unseen contexts.

**Perception Matters: Enhancing Embodied AI with Uncertainty-Aware** 2024

**Semantic Segmentation, ISRR 2024** [🔗](#)

We apply uncertainty aware semantic segmentation and improve success rates of the embodied AI task of searching for objects in an unseen indoor environment.

**When BERT Plays the Lottery, All Tickets Are Winning!, EMNLP 2020** [🔗](#) 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** 2019

**tri-training for suggestion mining, SemEval workshop @ 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).

## Awards

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**ELIZA Master's Scholarship,** Oct 2023

*Konrad Zuse School of Excellence in Learning and Intelligent Systems*

- Among the select (forty) M.Sc [🔗](#) CS candidates across Germany awarded the funding to do research in AI for two years.

## Research Projects

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### 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,

2022

*AutoML Lab - University of Freiburg* [↗](#)

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.

## Skills

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### Research Areas

Reinforcement Learning,  
World Models, Embodied AI,  
NLP

### Relevant Courses

Reinforcement Learning,  
Deep Learning, Optimal  
Control, AutoML

### Programming Languages

Python, Swift, Javascript, Go,  
Rust

### Libraries/Frameworks

Pytorch, Jax, NVIDIA Isaac  
Sim, Stablebaselines,  
AllenNLP

## Education

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### Master of Science - Computer Science, University of Freiburg

Specialization in Artificial Intelligence

Current GPA: **1.2**

Oct 2021 – present | Freiburg, Germany

Scale: 1.0 (*best*) - 4.0 (*passing*)

### Bachelor of Engineering - Computer Science, Anna University

CGPA: 8.24/10.0

Jun 2011 – Apr 2015 | Chennai