

Soren Larsen

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EDUCATION

- **University of California Santa Cruz** Santa Cruz, CA
Master of Science in Natural Language Processing Sept. 2024 - Dec 2025
- **University of California Santa Cruz** Santa Cruz, CA
Bachelor of Science in Computer Science Sept. 2019 - Jun. 2023

SKILLS

- **Programming Languages:** Python, JavaScript, Dart, Java, C/C++, Swift, SQL.
- **Machine Learning Libraries:** PyTorch, TensorFlow, scikit-learn, spaCy, NLTK.
- **Frontend/Backend Tools:** React, Flutter, Flask, Node.js, Docker.
- **Databases:** PostgreSQL, Firebase, MySQL.
- **Development Practices:** Agile (Scrum), TDD, CI/CD, Barista, XCTest, Espresso.

PROJECTS

- **UCSC NLP Chatbot with RAG** Jan 2025 - March 2025
 - **LLM Output Generation and Dataset Preparation:** Generated chatbot responses from multiple LLaMA 3 models (baseline, 3B, 8B) across 150+ student-facing queries, organizing outputs into structured evaluation datasets to enable downstream annotation and model comparison.
 - **Evaluation and Annotation of RAG Outputs:** Labeled model responses for coherence and relevance, identifying hallucinations and inconsistencies in both baseline and RAG-enhanced variants to support model selection and iteration.
 - **Prompt Optimization Across Models:** Refined prompt structures to enhance generation quality across LLaMA 3 variants, improving response fluency and retrieval grounding in the context of UCSC-specific queries.
 - **Tech Stack:** Python, LangChain, sentence-transformers (all-mpnet-base-v2), Chroma DB, LLaMA 3 (1B/3B/8B)
 - **Project Link:** <https://github.com/shannonrumsey/UCSC-RAG>
- **Transformer Language Model on Penn Treebank Dataset** Nov 2024
 - **Reduced Test Perplexity:** Developed and evaluated a Transformer Encoder model for autoregressive language modeling on the Penn Treebank (PTB) dataset. Achieved a reduction in test perplexity from 83.35 (baseline) to 39.11, showcasing significant performance gains.
 - **Scalable Model Design:** Optimized model architecture with sinusoidal positional encoding, multi-head attention, and tuned hyperparameters (embedding dimensions, learning rates, batch sizes) to enhance generalization on constrained datasets.
 - **Performance Evaluation:** Analyzed predictive accuracy across training, validation, and test sets to validate improvements. Explored trade-offs between model complexity and dataset size, demonstrating efficient and scalable architecture for smaller datasets.
 - **Project Link:** <https://github.com/iamsoren1/Language-Modeling-on-Penn-Treebank>

EXPERIENCE

- **Research Assistant – Multi-Agent AI Systems** Santa Cruz, CA
Intelligent Systems Lab, UCSC (Professor Yi Zhang) Apr 2025 – Present
 - **Applied Multi-Agent Architecture in Real-World AI System:** Working on a confidential, university-led AI system involving multi-modal agents for real-time media interpretation, user assistance, and contextual recommendations.
 - **Computer Vision and Scene Understanding:** Focusing on the Media Capture and Vision Understanding Agents—supporting tasks related to image/video ingestion, object recognition, and context extraction using state-of-the-art multi-modal models.
 - **Collaborative Research and Prototyping:** Collaborating with a cross-functional team in a research-driven lab environment to design, test, and iterate on complex AI pipelines involving real-time input processing and task orchestration.
- **Teaching Assistant for Professor Paul Vroomen** Santa Cruz, CA
Baskin Engineering at UCSC Sep 2024 - Present
 - **Support Across Multiple Courses:** Assisted in the instruction of over 150 students across two key courses: TIM 50 - Business Information Systems and TIM 58 - Systems Analysis and Design.
 - **Peer TA Mentorship and Course Familiarity:** Drew on prior experience with TIM 50 to help orient and support a new co-TA sharing insights into course structure, grading practices, and instructional approaches to ensure a smooth and effective transition.
 - **Direct Instruction and Technical Guidance:** Held regular office hours and delivered in-class lectures, offering support on course content including databases, SQL, UML modeling, and agile methodologies. Led discussions to improve student comprehension and engagement.
 - **Real-World Simulation and Agile Mentorship:** Acted as a mock stakeholder in TIM 58, providing critical feedback on project deliverables. Mentored teams on agile practices including SCRUM roles, sprint planning, and backlog refinement to prepare students for industry settings.
 - **Consistent and Fair Assessment:** Graded assignments, case studies, and exams across both courses with a focus on fairness and timely feedback, enhancing learning outcomes and overall student performance.
- **Boardal** San Diego, CA
Software Developer & Consultant — Agile Methodology Specialist April 2024 - Present
 - **Custom GPT for Automated Customer Outreach:** Developed a custom GPT model to generate outbound messages for marketing interns, eliminating the need for manual message creation and improving efficiency in customer acquisition efforts. Integrated the model with a spreadsheet system, enabling interns to query the GPT about customer records and communication status, streamlining customer management and ensuring accurate outreach tracking.
 - **Optimized Development Processes with Agile Practices:** Revamped software development workflows through Agile methodologies, enhancing cross-functional collaboration, accelerating feature delivery, and aligning new features with user needs through iterative feedback integration.
 - **Custom Notification System for Enhanced User Engagement:** Developed and deployed a tailored notification system, including personalized watch board alerts, to keep users informed about surfboards matching their preferences, driving increased user engagement and app activity.