Alexander Korte

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Education

Clemson University *Expected Graduation: May 2026*

Bachelor of Science in Computer Science — Minor in Artificial Intelligence ***GPA: 3.95/4.00***

Bachelor of Science in Physics

Skills

Languages (Ordered by proficiency): Python (10 years), C/C++ (3 years), JavaScript (8 years), TypeScript (3 years), HTML/CSS (10 years), Swift (8 years), C# (6 years), Java (6 years)

Software: Git, PyTorch, NumPy, Slurm, React.js, Next.js, Firebase, GCP, AWS, Unity, MongoDB

Experience

Arccos Golf - Technical Consultant (through CU Capstone) *Aug 2024 – Dec 2024*

- Developed and deployed an AI-powered golf course mapping system using **Segment Anything** and **Mask2Former**, reducing a 35-minute manual process to a single click and minimizing human intervention to only edge cases.
- Built production system with **React** frontend and **FastAPI** backend, enabling seamless integration through **REST API**
- Led a 5-person **agile** team in developing the **Custom ML pipeline** for satellite based golf course feature segmentation, implementing scalable inference scripts, and deploying **Docker** based production models to demand scalable nodes.

Clemson University Advanced Imaging Lab - Research Assistant *Aug 2022 – Present, Part-time*

- Working on Video Denoising, Volumetric Neural Representations, Computer Vision & Generative AI under Prof. Niyani Li
- Collaborated with a team of graduate students to develop a State-of-the-Art (SOTA) Unsupervised Video Denoising Machine Learning Model for Cellular Microscopy using **PyTorch**, achieving a 25-fold increase in training speed and a 50% reduction in size compared to existing SOTA methods. Second Author / Published and Presented at CVPR 2024.
- Implemented and compared SOTA models for quantitative evaluation of proposed methods.

CU-ICAR/VIPR-GS - Research Assistant *Aug 2023 – Present, Part-time*

- Collaborating with DEVCOM on autonomous offroad vehicles. Won "Best Poster in Focus Area 1 – Off-Road Autonomy"
- Modified the **GeoTransformer Pointcloud Registration** model for effective handling of feature sparse off-road environments. Offering improvements to a key component of modern **SLAM** architectures.

Projects

Audiffuse | *https://github.com/Stelath/audiffuse*

- Developed a generative AI/ML model using **PyTorch**, **PyTorch Lightning**, and **Hugging Face libraries**, capable of generating unique album art solely based on the audio of a song.
- Achieved through a Latent Diffusion based architecture with an Audio Transformer in place of the conditional head.

Comic Strip | *https://devpost.com/software/comic-strip-c0jw72*

- Engineered a web app for UGAHacks 2024 using **React** and **Flask** that generates comic books from a single text promp.
- Utilized **Prompt Engineering** alongside **GPT-4** & **OpenAI's API** for story generation and diffusion model prompts.
- Implemented custom AI pipeline to generate styleized comic panels and position text bubbles utilizing **CLIPSeg** model and a fine-tuned **Diffusion Model** deployed on Hugging Face demand scalable nodes.

CU-Rocketry Avionics Software Development | *https://github.com/CURocketEngineering*

- Led 7-person team developing flight software for 10,000-foot rocket at the 2024 Spaceport America Cup (SAC).
- Directed 4-person subteam implementing Active Aerobraking system using **Kalman filter** for predicting rocket velocity.
- Developed flight software for 2023 SAC enabling 128 Hz sensor data collection and **real-time telemetry** via LoRa Radio.

Accomplishments

2x AI/ML Top Conference Presenter (2024 CVPR Workshop & 2024 ICIP)

- Poster presentation on Unsupervised Microscopy Video Denoising (CVPR 2024). A novel model that improves the quality of microscopy videos by removing noise without needing prior knowledge of its type.
- Acted as a proxy presenter for Mary Agieboto on her paper: Unsupervised Coordinate-Based Video Denoising (ICIP 2024). A model designed to perform high quality video denoising in extremely data sparse environments.

2024 CU HackIt - Best Implementation | *https://devpost.com/software/munch-67o4eh*

- Won 1st place (62 teams) at CU HackIt for developing a native iOS app to help users find mutually preferred restaurants.
- Led front & backend development, using **Swift**, **Firebase**, **Node.js**, integrating **Google Auth** and **Google Places API**.

Theta Tau Professional Engineering Fraternity | *https://clemsonthetatau.com/*

- Developed full stack website for members using **Next.js** and **Firebase**, achieving 0.2s load time (5x improvement).
- Implemented **NoSQL** database, **Storage Buckets**, and **Serverless Functions** for improved performance and reliability.