Claire K. Siroky

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EDUCATION: The University of Texas at Austin

Master of Science in Computer Science concentration in Artificial Intelligence and Machine Learning	**Jan. 2021 – Dec. 2023**
Certificate in Elements of Computing (Computer Science) – 18 credit hours	**Jan. 2019 – Dec. 2021**
Bachelor of Science in Mechanical Engineering with a concentration in Design and Manufacturing, UT GPA: 3.5/4.0	**Aug. 2016 – Dec. 2020**

HONORS:

University Honors (Fall: 2016, 2017, 2020); UT Mechanical Engineering/ Women in Engineering, Texas Exes, & Exxon Mobil Teagle Scholarships (Fall 2016 – Spring 2018);
Equal Opportunity in Engineering Honor Roll (Fall 2016 – Spring 2017); Alpha Lambda Delta & Phi Eta Sigma Honor Societies (Spring 2017); Taekwondo 1st Degree Black Belt (July 2011)

RELEVANT COURSES: (*) denotes in progress, (G) denotes Graduate-Level

Computer Science: Reinforcement Learning (*G)   Case Studies in ML (*G)   Machine Learning (G)   Deep Learning (G)   Parallel Systems (G)   Natural Language Processing (G)
  Online Learning & Optimization (G)   Software Engineering I   Web Programming   Software Design   Programming & Engineering Computational Methods

Math: Adv. Linear Algebra for Computing (G)   Engineering Statistics   Discrete Math   Adv. Calculus App. II (Vector Calc)   Differential Equations w/ Linear Algebra

Mechanical Engineering (ME): Robot Mechanism Design (G)   Mechatronics & Lab   High Throughput Nanopattern (G)   Engineering Communications
  Dynamic Systems/Controls & Lab   Engineering Finance   Materials Selection   ME Design Methodology/Project   Machine Tool Operation for Engineers

PROJECTS:

Student, **NLP Analysis of Natural Language Inference of Negation using ELECTRA-Small and SNLI**   **Dec. 2021**
- Analyzed how negation of sentences impacts the pretrained ELECTRA-Small model's performance & flaws for a fine-tuned baseline and a fine-tuned negation implementation
- Utilized Stanford Natural Inference Corpus (SNLI) dataset, Python, Pandas, PyTorch, HuggingFace, LaTeX, Google Colab Pro, GPU, Excel

Student, **NLP Neural Semantic Parsing with Attention-based Neural Machine Translation Model for Question Answering of US Geography Facts**   **Nov. 2021**
- Utilized Python, PyTorch, NumPy, and GeoQuery dataset to design, develop/build, tune, train, and test Semantic Parsing with a Seq2Seq Attention Model **from scratch**
- Achieved model performance of 78.74% token accuracy and 48.33% exact match accuracy on GeoQuery dev dataset within time limit without crashing
- **Outperformed** required project specs for token and exact match accuracies **by 8.74% and 3.33%**; Achieved max grade **100, 15 points above class average**

Student, **4 Projects utilizing a diversity of both classical and modern approaches that manage and exploit Parallel/Concurrent Systems**   **Sept. – Dec. 2021**
- Designed, built/developed, programmed, scaled, modeled, and tested sequential and different work-efficient parallel/concurrent implementations in 4 Projects:
  - **Prefix Scan Algorithm and Synchronization Barriers:** Pthreads, C/C++, Python, Matplotlib, NumPy
  - **Nvidia GPU/GPU Programming with CUDA (from scratch) & Thrust for K-means Clustering Unsupervised ML Algorithm:** C/C++, Python, NumPy
  - **Go (Golang) to compute and compare Binary Search Trees data structure equivalence**
  - **Rust to implement Two-Phase-Commit (2PC) Protocol**
- Effectively communicated approaches, insights, and analysis of performance data measurements, scalability, and complexity to compare my sequential and different concurrent/parallel implementations through a written report per project containing visual graphs/tables; Linux OS from SSH into Codio platform for all 4 projects

Student, **DL Autonomous Computer Vision based Go-kart Video Game Auto-Pilot Racer** (overall top 16 class tournament video; Mine upper right corner-cks782)   **July 2021**
- Designed, developed/built, tuned, trained, tested, and monitored performance of a controller and Convolutional Neural Network (CNN) model that processes an image input to detect/predict track center/aim-point for a 3D open-source kart racing game simulator, SuperTuxKart (Pystk), to generalize on various known/unknown racetracks **from scratch**
- Achieved generalized performing model/controller; **Placed 4th among 215 people** in a class tournament based on unreleased/unseen test tracks
- Utilized Python, PyTorch, Torchvision, NumPy, Pystk, Matplotlib, (PIL)/Pillow, TensorFlow's TensorBoard, Google Colab, GPU, Anaconda, Git/GitHub, PyCharm

Student, **DL Autonomous Computer Vision based Hockey Player Agents in SuperTuxKart Ice-Hockey Game**   **July – Aug. 2021**
- Designed 2 autonomous hockey player agents with team; Achieved overall average score of 1.5 goals scored against AIs in four 2v2 matches which played max of 3 goals or 2 minutes per match; Outperformed AI team's overall average scored goals by 1 since AIs average scored goals against our agents was 0.5

Student, **Instant Pot Food Recipe Website**   **Sept. – Dec. 2020**
- Collaborated with MIS student to create a user-friendly Instant Pot food recipe website (SIC Recipes) which included user login/registration, random recipe function, get/add/delete user recipe history/favorites, add/delete user favorites, user verifications for account/admin add recipe functionality; MySQL database stored user/recipe information and bridged user-recipe history/favorites; Utilized JavaScript, HTML, CSS, SQL, MySQL, PHP, Dynamic HTML features, Cookies, jQuery, AJAX, DOM

Student, **NASA Wi-Fi Antenna Mount**   **Aug. – Dec. 2020**
- Team presented project at showcase and **placed 5th among 20 teams; Rewarded cash prize**
- Collaborated with 3 ME students and a NASA sponsor on designing, analyzing kick loads and FMEA SolidWorks simulations, and managing priorities, budgets, deliverables, and deadlines for 3 deployable Wi-Fi antenna mounts for future NASA Lunar Gateway missions; Prototyped candidate solution

Student, **Viral/Bacterial Infections Rapid Testing Surface Enhanced Raman Spectroscopy (SERS) Nanotechnology Device**   **March – May 2020**
- Collaborated with 2 PhD materials/mechanical engineering students on researching SERS, creating a hypothesis, and implementing an iterative Lean Innovation Approach and Business Model Canvas to conclude if project device was a Minimum Viable Product and what resources/funds were required to get to the first product

Student, **Study Abroad Maymester,** Milan, Italy   **May – June 2018**
- Collaborated with multidisciplinary engineering group on VR paper; Analyzed case studies of Italian businesses executing the 14 Grand Engineering Challenges

Hackathon Participant, **Virtual Reality Spanish Translator – HackTX UT Austin**   **Oct. 2016**
- Designed VR Spanish translator in collaboration with a multidisciplinary team in a 24 hour Hackathon; Tasked with designing VR scenes by utilizing Unity Asset Store despite no prior experience in Unity; **Finished top 10 among 100+ teams;** Team utilized Unity, C#, Oculus VR, Samsung Gear VR, and the Asset Store

WORK EXPERIENCE:

Intern, Mechanical Design Engineering, **High End Systems (an ETC company),** Austin, TX   **May – Aug. 2019**
- Collaborated with a team of engineers in the R&D department to innovate, design, and draft entertainment LED automated light fixtures and control consoles
- Utilized Vault, SolidWorks 2019, SolidWorks Sheet Metal, Calipers, and 3D printing

Cashier, **Tout Suite,** Houston, TX (June – Aug. 2016); *Construction Volunteer,* **National Geographic Student Expedition,** Fiji (June 2015)

ACTIVITIES:

Ambassador, **Cockrell School of Engineering – UT Austin**   **Aug. 2018 – May 2020**
- Welcomed and provided tours and information sessions to new and prospective students and their families through effective public communication
- Engaged in STEM outreach activities, facilitated leadership retreats, volunteered at special events, and mentored new ambassadors

Committee Member/Member, **Alpha Phi Sorority,** Austin, TX   **Aug. 2016 – May 2020**
Ambassador, **Study Abroad Cockrell School of Engineering – UT Austin**   **Aug. 2018 – May 2019**
Member, **Society of Hispanic Professional Engineers** (Aug. 2016 – Dec. 2020); **Women in Engineering** (Aug. 2016 – May 2020); **ASME** (Aug. 2018 – May 2020)

SKILLS:

Languages/Databases: Python, MATLAB, C/C++, CUDA, Go (Golang), Rust, JavaScript, SQL, MySQL database, HTML, CSS, PHP, LaTeX, Unix/Linux/Windows Shells
Tools/Libraries/Other: PyTorch, NumPy, NLTK, SpaCy, SciPy, HuggingFace, Pandas, Matplotlib, TensorFlow's TensorBoard, Scikit-learn, Thrust, Pthreads, Object-Oriented Programming, Supervised/Unsupervised ML, DHTML features, Cookies, jQuery, AJAX, DOM, Git, GitHub/GitLab, Notebooks (Jupyter and Google Colab), Agile, CI/CD