

# 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

**Certificate** in Elements of Computing (Computer Science) – 18 credit hours

**Bachelor of Science** in Mechanical Engineering with a concentration in Design and Manufacturing, UT GPA: 3.5/4.0

**Jan. 2021 – Present**

**Jan. 2019 – Dec. 2021**

**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

<b>Computer Science:</b> Online Learning & Optimization (*)	Natural Language Processing (G)	Parallel Systems (G)	Deep Learning (G)
Programming & Engineering Computational Methods	Software Design	Web Programming	Software Engineering I
<b>Mechanical Engineering (ME):</b> Robot Mechanism Design (G)	High Throughput Nanopattern (G)	Mechatronics & Lab	Dynamic Systems/Controls & Lab
Engineering Finance	Engineering Communications	Machine Tool Operation for Engineers	ME Design Methodology/Project
<b>Math:</b> Adv. Linear Algebra for Computing (G)	Engineering Statistics	Discrete Math	Differential Equations with Linear Algebra
			Adv. Calculus App. II (Vector Calc)

## 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 4<sup>th</sup> 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