ALEXANDER N. CHIN

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EDUCATION

The University of Texas at Austin — *Expected graduation: Fall 2029*

- Doctorate in Philosophy - Electrical and Computer Engineering Major
- Cumulative GPA: IDK/4.0

The University of Texas at Dallas — *Spring 2024*

- Bachelor of Science degree - Computer Science Major
- Member of the CS^2 Computing Honors Program
- Cumulative GPA: 4.0/4.0
- Summa Cum Laude

George Ranch High school, Rosenberg TX — *Graduation: Spring 2021*

- Class Rank: 4/669
- Cumulative GPA: 119.0/100.0

TECHNICAL SKILLS

Programming Languages:	Python, C/C++, Java, MIPS Assembly, Shell Bash, Go, Fortran
Web Development Tools:	JavaScript, CSS, HTML, React.js, Node.js, Express.js, MangoDB, Apache Velocity
Data Science Tools:	Python, Jupyter Notebook, Pandas, NumPy, MatPlotLib, NetworkX
ML/AI Tools:	Spacy, NLTK, Regex, Scikit Learn, OpenCV, Mediapipe
SRE Tools:	Kubernetes, ArgoCD, Terraform, Jenkins, Docker, Aurora/Mesos, Grafana, Prometheus, Loki
Other Tools:	Figma, Cameo Systems Modeler, Omni Graffle

PERSONAL EXPERIENCE

Medallia — *Summer 2024-Present*

Site Reliability Engineer

- Executed over 200 service deployments/updates while maintaining FEDRAMP-high security protocol constraints in AWS GovCloud environment.
- Developed a SSL certificate manager that streamlines the replacement of certificates into the kubernetes environment.
- Ensured 24/7 availability of all services in Govcloud via on-call rotation and collaboration with application development teams.
- Efficently migrated services from Aurora/Mesos to Kubernetes.
- Leveraged Grafana and Loki to create monitering dashboards and pin point error logs aggregated from the entire GovCloud environment.
- Designed architecture design diagrams to support significant change requests to the environment.
- Skills: Kubebernetes, Docker, ArgoCD, Jenkins, Aurora/Mesos, Python, Bash, Grafana, Prometheus, Loki, Omni Graffle

Integrated Nano Computing Laboratory — *Fall 2024-Present*

Researcher

- Grew skyrmion stacks using sputtering machine and characterized them using VSM and MFM
- Imaged skyrmions using MOKE.
- Refined simulations of magnetic tunnel junction-based true random number generators to include both adiabatic and non-adiabatic torques.
- Developed and verified a simulation of antiferromagnetic tunnel junction-based true random number generators to show super-fast switching and low power operations.
- Skills: Fortran, Python, Sputter, VSM, MFM, MOKE

Neuro Spin Compute Laboratory — *Summer 2022-Spring 2024*

Research Assistant

- Investigated hybrid logic locking systems using strain-modulated nanomagnets under Dr. Joseph S. Friedman
- Spearheaded the development of **logic-locking programs** via creative applications of graph partitioning algorithms.
- Encrypted more than **500,000 different netlists** and ran them through a satisfiability solver simulation to quantify algorithmic security.
- Strengthened encryption times **from 2 seconds to over 12 hours of encryption** against a satisfiability solver.
- Skills: Python, Jupyter Notebook, Pandas, MatPlotLib, Regex, NetworkX, Figma

Center for Robust Speech Systems — *Fall 2023-Spring 2024*

Research Assistant

- Analyzed Human Exploration Research Analog audio recordings under Dr. John H. L. Hansen in collaboration with **NASA**
- Optimized speech audio detection inferences for over 16 hours of audio through open-source ESPnet framework
- Analyzed **word error rates and signal noise ratios** for different audio recording devices using Whisper automatic speech recognition model
- Skills: ESPnet, Python, Pytorch

Collins Aerospace, Richardson, TX *Summer 2023*

Student Engineering Project Program (SEPP) Software Engineering Intern

- Leveraged model-based systems engineering (MBSE) design paradigms to develop a tool that **automates the generation of formal engineering documents** from a Cameo model for Collins Aerospace's Mission Systems projects
- **Reduced document production costs by 98%** through the elimination of manual documentation generation
- Projected to save **2.3% of the total contract or 6.8 million dollars** in a directly supported project
- Collaborated with other engineering teams to understand their specific documentation needs and developed tailored solutions
- Gave oral **presentation to senior executives** in Cedar Rapids, Iowa, and presented in a site-wide poster presentation
- Composed extensive user manuals and trained engineers to utilize and further extend our product
- Skills: Java, Apache Velocity, Cameo Systems Modeler

PAPERS AND PRESENTATIONS

1. **A. N. Chin**, S. Chen, J. H.L. Hansen, "A Comparative Study for the Human Exploration Research Analog Based on Speech Recognition and Speaker Diarization", NASA Human Research Program Investigators' Workshop, Feb. 2024 (Poster presentation).
2. A. J. Edwards, N. Hassan, J. Arzate, **A. N. Chin**, D. Bhattacharya, M. M. Shihab, P. Zhou, X. Hu, J. Atulasimha, Y. Makris, J. S. Friedman, "Physically & Algorithmically Secure Logic Locking with Nanomagnet Logic", IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (Submitted).
3. J. D. Arzate, **A. N. Chin**, Y. Makris, A. J. Edwards, J. S. Friedman, "Hardware Redaction with Strain-Protected NML eFPGAs", Government Microcircuit Applications & Critical Technology Conference, Mar. 2024 (Oral presentation).
4. **A. N. Chin**, J. D. Arzate, Y. Makris, N. Hassan, A. J. Edwards, J. S. Friedman, "Hybrid Hardware Security Systems with Strain-Modulated Magnetic Anisotropy," Conference on Magnetism and Magnetic Materials, Oct.-Nov. 2023.(Oral presentation)
5. **A. N. Chin**, J. D. Arzate, Y. Makris, N. Hassan, A. J. Edwards, J. S. Friedman, Physically Secure Hardware Redaction and Logic Locking with Hybrid Logic Systems, Government Microcircuit Applications & Critical Technology Conference, Mar. 2023.(Poster presentation)

PROJECTS

Ready Player Credit: Gamify Financial Literacy *Spring 2023*

- Developed and designed a gamified banking experience, during Formula Hack at UT Austin with a team of 3 members, securing First Prize for Capital One's Best Financial Hack among 40+ competing teams
- Utilized a MERN stack and Chakra React Library to develop a fully functional simulated credit system that mimics state-of-the-art online banking solutions
- Created 13 custom React components meticulously crafted to realize our original vision for Ready Player Credit, ensuring seamless functionality and captivating user interaction while maintaining consistency with our initial design concept
- Integrated third-party software packages such as Eleven Labs and PropelAuth to enhance user experience with humorous AI narrations and robust single sign-on authentication, respectively, resulting in increased user engagement and streamlined security measures
- Skills: MongoDB, Express.js, React.js, Node.js, Chakra UI

ErgoBlink: Posture and Blink Detection *Spring 2023*

- Developed an application that utilizes computer vision technology to analyze posture and blink frequency, promoting a healthier relationship with technology usage.
- Collaborated with a team of three developers in a 24-hour hackathon to deliver a working prototype of the application
- Implemented OpenCV and Mediapipe libraries to efficiently extract 468 facial landmarks from live webcam streams
- Constructed a machine learning pipeline comprising Logistic Regression, Ridge Classifier, Random Forest Classifier, and Gradient Boosting Classifier to facilitate model training and gesture recognition
- Trained a deep learning model with 391 diverse data points sourced from the webcam video to improve the accuracy of gesture recognition
- Ranked in the top 5 among all the projects in the hackathon, demonstrating the high quality of the developed solution
- Skills: Python, Jupyter Notebook, OpenCV, Mediapipe, NumPy, Pandas, Scikit Learn

ResuBot: Resume Grader *Fall 2022*

- Designed a web application that leveraged **natural language processing** to classify, recommend jobs, and grade inputted resumes on a 100-point scale and offers possible improvements
- Implemented resume classifier via an implementation of an **XGBoost ML model** with 78% accuracy
- Expanded functionality to recommend jobs based on resume content by fitting a **count vectorizer** to a **dataset of over 24,000 postings** as well as basic web scraping for job openings and taking the **cosine similarity** of the jobs with the resume

- Leveraged natural language processing tools to parse and grade resume content based on 5 main features including word choice, grammar, required sections, etc.
- Designed UI screens collaboratively for the web page with React.js leading to cloud deployment via AWS
- Skills: JavaScript, CSS, HTML, React.js, Python, Pandas, Matplotlib, NumPy, Regex, Spacy, NLTK, Scikit Learn

Multi-Threaded Hashing *Fall 2022*

- Implemented Jenkins-One-At-A-Time hashing algorithm to generate unique hash codes for large strings
- Constructed a tree of threads to hash up to **4096 substrings in parallel** on a 46 core server
- Decreased the run time by a **factor of 12**
- Synthesized a dataset recording the performance of more than **17,000 different tests**
- Visualized the distribution of the data to analyze the effect of mulithreading on a multi-core system and to calculate the number of threads that optimized run-time (performance at 256 threads)
- Skills: UNIX, C, Shell Bash, Python, Regex, Jupyter Notebook, NumPy, Pandas, Matplotlib

Sorting Visualizer *Spring 2022*

- Implemented a display of 4 fundamental sorting algorithms while limited to the bounds of MIPS Assembly
- Synthesized advanced cache organization methods, stack manipulation, and dynamic memory allocation
- Optimized the memory usage of **100 dynamically allocated objects** and animated swaps with the bitmap
- Skills: MIPS Assembly

Cidercade Database *Fall 2021*

- Designed a binary tree to store data from pre-existing databases into new database files by synthesizing object-oriented programming, and templates
- Implemented 5 commands (insert, search, edit, remove, traverse)
- Skills: C++

Pentatonic Music Maker *Spring 2019*

Programmed music application that allows users to program music based on musical scale to make musical loops via a metronome
- Calculated imputed BPM and a series of button press events to control note states
- Skills: Java

RELEVANT COURSEWORK

- Artificial Intelligence [A]
- Data structures and Algorithms [A]
- Computer Architecture [A]
- UNIX and other Systems [A]
- Programming Language Paradigms [A]
- Digital Logic [A]

EXTRA CURRICULAR

Artificial Intelligence Society *Fall 2017 - Spring 2021*

- Collaborated with 5 other students and one mentor to create a resume grading bot utilizing NLP techniques
- Competed in a Hackathon and placed 5th out of 50 project submissions
- Skills: Ableton Live, Adobe Premiere Pro

Texas Technology Students Association *Fall 2017 - Spring 2021*

- Composed and produced a musical piece for the **Music Production event**, which placed at the regional and state levels
- Developed a E-commerce website for **Webmaster event**.
- Edited the video and mixed the audio for a short film for the **Digital Video event** and placed at the regional level
- Skills: SciKit Learn, Pandas, Matplotlib, Jupyter Notebook, NumPy, MediaPipes, OpenCV

Teal Honey *Spring 2020 - Summer 2021*

- Created and managed a music group with another classmate.
- Produced, mixed, and mastered **3 tracks** professionally
- Distributed tracks via DistroKid to **all major platforms** (Spotify, Apple Music and iTunes, TikTok, Instagram, etc)
- Created artist and album art for artist accounts.
- Skills: Ableton Live, Adobe Illustrator, Adobe Photoshop, Vocal, Guitar, Piano, Ukulele, Kalimba, Bass, Cello

Horn, Wind Symphony *Fall 2017 - Spring 2021*

- held Brass Captain and PT Captain positions (2021, 2020 respectively)
- Competed and led varsity marching band all 4 years
- Qualified for State Solo and Ensemble, Freshman through Senior year
- Skills: Horn, Mellophone

VOLUNTEERING

National Honor Society *Fall 2019 - Spring 2021*

- Received more than **80 service hours** tutoring peers, working at food banks, and cleaning up Houston Arboretum

Tri-M Music Honor Society *Fall 2019 - Spring 2021*

- Held treasurer office: managed all club expenses and ensured all members received cords for graduation.
- Performed mini concerts at senior homes.

Mu Alpha Theta Math Honor Society *Fall 2019 - Spring 2021*

- Received more than **20 service hours** tutoring math.

AWARDS

NSF Research Experiences for Undergraduates (REU) Fellow *Summer 2022 - Spring 2024*

- Primary funding for undergraduate research within the Neuro Spin Compute Laboratory under Joseph S. Friedman

Dean's List *Fall 2021 - Spring 2024*

- Maintained a GPA within the top ten percent of UT Dallas students

Undergraduate Research Scholar Award *Fall 2022*

- Competitive award made by the Office of Undergraduate Education

Academic Excellence Scholarship *Fall 2021*

- Awarded $13000 for recognition of academic merit

National AP Scholar *Spring 2020*

- Maintained above a 4 average on all AP tests and received a 4 or 5 on at least 8 tests

REFERENCES

Joseph S. Friedman, Associate Professor
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