

## SUMMARY

Master's student in Computer Science at the University of Sydney (9 Course Distinctions) and BSc graduate from Bilkent University (Magna cum Laude) with a strong foundation in cybersecurity, algorithms, Machine Learning and distributed systems. Hands-on experience includes CTF challenges, MITM attacks, vulnerability assessment using Metasploit, NLP libraries and secure application development across three software engineering internships.

## EDUCATION

### University of Sydney Sydney, NSW, Australia

Master's of Science in Computer Science. 2024-26

- System Programming
- Parallel and Distributed Computing
- Data Engineering
- Information Theory and Complex Systems
- Cybersecurity Engineering
- NLP
- Algorithms & Data Structures
- Error Control Coding
- Large Scale Networks
- Applied Cybersecurity

### Bilkent University Ankara, Turkey

Bachelor's of Science in Computer Engineering

CGPA: 3.60/4 Duration: 2019 – 2023

Graduated: Magna cum Laude

- Algorithms (CS474 or CS502)
- Statistical Learning & Data Analysis
- Estimation & Detection Theory
- Engineering Maths I
- Probability & Statistics
- Algorithms & Programming I & II
- Database Systems
- Neural Networks
- Introduction to Machine Learning
- Automata Theory & Formal Languages
- Data Structures I & II
- Operating Systems

## SKILLS

### Programming Languages

- C++/C
- Java
- Python
- JavaScript
- GoLang
- SQL

### Frameworks & Programs

- Spring-boot
- Express.js
- Django
- Flask
- Metasploit
- ZAPROXY

### Operating Systems

- Ubuntu
- MacOS
- Kali Linux

### Important Libraries

- Pytorch
- Numpy
- Gurobi
- CONVEXOPT
- Tensorflow
- Pandas
- JDBC

## PROFESSIONAL EXPERIENCE

### Software Engineering Intern (SRE Team)

Bayzat | June - August 2022

- Implemented a software management solution aimed at streamlining infrastructure and deployment changes.
- Utilized GoLang as the primary programming language to construct the core architecture of the application.
- Engineered a user-friendly Text User Interface (TUI) using progressive libraries like Bubble Tea and Glow.
- Developed a seamless JSON data integration pipeline, enabling the tool to effectively process and manage infrastructure changes.

### Software Engineering Intern

Radity | Sept - Dec 2021

- Architected packages for a dynamic SaaS application, effectively accelerating the software development lifecycle.
- Collaborated proficiently with SMTP and Django libraries, seamlessly integrating critical functionalities into the application.
- Proactively identified security vulnerabilities by conducting an exhaustive investigation of one of the company's websites using Metasploit.
- Transformed the developed solution into a robust boilerplate, now serving as a foundation for other applications within the organization.

### Software Engineering Intern

FDNSOFT | June 2021 - Aug 2021

- Introduced enhancements, including an advanced search feature and visually captivating graphics, to a company application.
- Showcased exceptional problem-solving skills by identifying and rectifying bugs, while also playing a pivotal role in crafting user-centric UI designs for new interfaces.
- Harnessed the power of Flutter for frontend development, seamlessly blending creativity and functionality to enhance user experiences.
- Leveraged the capabilities of Node.js for backend development.

## HONORS

- 9 Course Distinctions at University of Sydney
- 5 High Honors : Spring 22-23, Fall 22-23, Spring 21-22, Fall 20-21, Fall 19-20
- 3 Honors : Fall 21-22, Spring 20-21, Spring 19-20
- Bilkent Undergraduate Scholarship 2019-23
- 2nd Rank - 2014 Inter School Essay Competition, Tyndale Biscoe & Mallinson Educational Society

## ORGANISATIONS

- ACM
- IEEE
- ISC2

# PROJECTS

## Catch The Flags (Applied Cybersecurity)

- Successfully completed 7 out of 8 CTF challenges spanning reverse engineering, cryptography, and network security domains.
- Reverse engineered binary executables using industry-standard tools including Ghidra, Frida, and apktool to analyze program logic and extract hidden flags.
- Developed custom Python scripts to perform automated password cracking and cryptographic attacks.
- Executed a Man-in-the-Middle (MITM) attack to intercept and analyze live network traffic, demonstrating hands-on proficiency in network-layer exploitation

CTF, Reverse Engineering, Ghidra, Frida, apktool, Python, MITM, Network Security

## Democratic Nation Convention Hack Incident Review (Applied cybersecurity)

- Conducted an in-depth investigation into the 2016 Democratic National Convention cyberattack, identifying the attack vectors, tools, and techniques exploited by the threat actors.
- Analyzed the security vulnerabilities and operational failures — including spear-phishing and credential theft — that enabled the breach.
- Authored a structured incident review report detailing the timeline, impact, and recommended mitigations.
- Presented findings to the class, demonstrating applied knowledge of real-world cybersecurity threats and defense strategies.

Incident Response, Threat Analysis, Spear-Phishing, Cybersecurity, Technical Writing

## Lung Disease Classifier: Machine Learning Achievement

- Engineered diverse machine learning models (SVMs, Neural Networks, ViTs) to classify lung X-rays into five categories.
- Compared the performance of different structures on the classification task.
- SVMs trained using 1 v 1 and 1 v all were also compared.
- Demonstrated a remarkable 92% accuracy on the test dataset.
- Earned a perfect score for the final report.

PyTorch, CONVEXOPT, NUMPY, SVMs, ViT, Neural Networks

## Breast Cancer Feature Selection Using Information-Theoretic Measures

- Compared different mechanisms to select subset of features that maximized the mutual information about the presence or absence of cancer.
- Used measures such as Mutual Information, Conditional Mutual Information to find the subset of features that contained maximum information about the label.
- Built and trained PyTorch-based Autoencoder for dimensionality reduction.
- Used PCA for dimensionality reduction
- Received a distinction for the project final report.

Java, Python, Keras, Pandas, JIDT, PyTorch

## Paper Review - Estimation and Detection Theory

- Reviewed and analyzed the paper by Clayton Scott and Robert Nowak extending NP classification to non-VC classes.
- Summarized key contributions: tighter PAC bounds for NP-ERM and introduction of NP-SRM for model selection.
- Explained theoretical properties including consistency, convergence rate, oracle inequality, and false alarm control.
- Critically evaluated the paper's strengths and limitations, including missing computational complexity analysis.
- Submitted as part of the Estimation and Detection Theory (EEE 539) course at Bilkent University.

## MLRI - MRI Classification via Transfer Learning

- Pioneered an Alzheimer's disease detector utilizing Convolutional Neural Networks.
- Achieved an outstanding accuracy of 98.67% on the test dataset.
- Performance of different CNNs like RESNet, VIG16, Inception, et cetera were analyzed and compared.
- Implemented the project using TensorFlow technology.
- Attained A+ grade for the project.

Tensorflow, Python, Transfer Learning

## Advanced Neural Networks Project

- Constructed and compared various RNN models for human activity prediction, including Gated Recurrent Networks, LSTMs, and RNN.
- Constructed Autoencoders and FCNs.
- Developed models from scratch using Numpy library.
- Demonstrated an impressive 92% accuracy on the Test set.
- Executed as part of the Neural Network course at Bilkent, resulting in a perfect grade.

Python, Numpy, FCNs, RNNs, LSTMs, Autoencoders

## Homophily and Giant Connected Component in Stock Time Series Data - Large Scale Networks

- Preprocessed time-series data for 4440 stocks over a 5-month period from multiple APIs and datasets
- Developed graph representations of stock relationships using entropy-based measures (Pointwise Mutual Information) and Mean Absolute Distance
- Analyzed graph properties such as sparsity, clustering coefficient, and connectivity under various proximity thresholds
- Observed centrality trends and validated hypotheses regarding index fund influence and sector-based clustering
- Interpreted the presence of giant components as evidence of market sentiment and interdependence
- Created visualizations, presentation slides, and a project video
- Wrote core Python programs to compute distance metrics (PMI and MAD) and construct stock similarity graphs

Pandas, Python, PyTorch, NetworkX, Hugging Face Dataset, yFinance

## Building and Orchestrating a Data Pipeline for an Analytics Suite - Data Engineering

- Built an end-to-end data pipeline using Apache Airflow for orchestration and dbt for transformation, deployed via Docker containers
- Created and scheduled custom Airflow DAGs to extract, transform, and load both synthetic and real-world healthcare data (MIMIC), ensuring modular and traceable workflows.
- Constructed staging, dimension, and fact models using dbt; implemented integrity tests and macros to validate transformations and ensure data consistency.
- Built interactive dashboards in Apache Superset to visualize insights from the transformed data warehouse, supporting business and clinical decision-making.
- Documented pipeline architecture, setup process, and system components in a technical report; packaged the entire solution in a portable Docker environment.

Python, Docker, yaml, Apache Airflow, Apache Superset, Dbt

## Pandemic Manager (Object-Oriented Programming)

- Created mechanism that streamlines student information by enabling them to input PCR, HES Codes, and Vaccine details
- Designed the architecture of the application alongside teammates.
- Wrote backend code to monitor student campus access, attend classes, and weekly reports, fostering a safe academic environment.
- Used MySQL and Spring-boot for the backend of the application.
- Completed web based application and presented and demonstrated it.

HTML5, CSS, Java, Springboot, MySQL, UML diagrams, Entity-Relationship Diagram

## Programming Language Design & Parser Implementation (CS319)

- Designed a custom programming language with formally specified execution semantics, declaration rules, operator precedence, expression evaluation order, and parameter passing conventions, with written justification for each design decision.
- Extended a previously built lexical analyzer (lexer) to return tokens and track line numbers for error reporting.
- Implemented a full parser using the yacc tool, capable of accepting syntactically valid programs and reporting the exact line number of syntax errors in invalid ones.
- Ensured the language design prioritized readability, writability, and reliability while remaining internally consistent and unambiguous.

Compiler Design, yacc, Lexical Analysis, Parser, Formal Language Design, C

## SnatchIt

- Spearheaded the creation of SnatchIt, an application for Bilkent students to exchange and sell academic books.
- Managed the team as the project leader.
- Implemented frontend using Android studio and Java.
- Used Firebase as the database.
- Functionalities included book request creation, book search, buy, or selling.
- Successfully executed during the Introduction to Algorithms II course, earning an A grade.

Java, Android Studio , XML, Firebase

## Election Strategy Optimization – Integer Linear Programming (IE 400)

- Modeled a multi-part election strategy problem as a series of Integer Linear Programs (ILPs), optimizing campaign investment across 35 cities on a 5×7 grid under neighborhood and voting constraints.
- Formulated and solved a minimum-cost investment plan (Part A) ensuring majority city wins.
- Designed a region partitioning ILP (Part B) to maximize council seats across 7 connected regions of 5 cities each, subject to border laws and adjacency constraints on central cities.
- Extended the partitioning model (Part C) with graph connectivity constraints, enforcing spatial contiguity via domino-based neighbor forcing across a 5×5 inner grid.
- Implemented all formulations in Gurobi and validated optimal solutions computationally.

Integer Linear Programming, Gurobi, Optimization, Python

## CodeBank: Full-Stack Development Project

- Developed a discussion and coding problem platform, enabling user engagement and coding interview simulations.
- Designed the database and application architecture alongside teammates.
- Functionalities including signup, login, meeting organization, discussion forum, problem solving challenges., et cetera.
- Implemented Spring Boot backend, React frontend technologies, and SQL.
- Successfully delivered for the Database Systems course at Bilkent University.
- Received an A grade for the project.

## Programming LDPC Code Simulation for IEEE 802.16e (WiMAX) – Error Control Coding (ELEC5507)

- Implemented a full IEEE 802.16e-compliant LDPC coding system in MATLAB, covering encoding, BPSK modulation, SPA-based decoding, and BER/FER performance evaluation across AWGN and Rayleigh fading channels.
- Constructed the WiMAX parity-check matrix by expanding a 12×24 base matrix.
- Implemented the Sum-Product Algorithm (SPA) using LLR-based belief propagation on a Tanner graph with 2304 variable nodes and 1152 check nodes.
- Simulated and analyzed BER/FER performance, demonstrating near-zero BER with a ~1.5 dB Eb/N0 increase in AWGN and classic waterfall behavior under Rayleigh fading up to 60 dB.

LDPC, Error Control Coding, MATLAB, WiMAX, IEEE 802.16e, SPA Decoding, Belief Propagation, Channel Simulation

## RoadVisor

- Contributed to the development of an innovative Augmented Reality navigation application.
- Integrated machine learning models to aid drivers in road sign detection, pedestrian recognition, and traffic light identification.
- Finetuned Yolov7, road boundary, and lane detection models.
- Deployed the machine learning models on cloud.

Python, Flask, Pytorch, Yolov7, Finetuning, Lane detection models