






ERIC ZACHARIA

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CURRENT POSITION	Data Analytics Master's Student Department of Computer Science, University of Chicago	September, 2020 – present
EDUCATION	M.S. in Computer Science , University of Chicago B.S. in Aerospace Engineering , Syracuse University	December, 2021 2016
PUBLICATION	Eric Zacharia, Melissa Green, <i>Hydrodynamics of Dolphin Caudal Fins</i> , 2016 (available here)	
SKILLS	Python, NumPy, Pandas, Scikit-learn, matplotlib, Jupyter, PyTorch, TensorFlow, Keras, SciPy, SQL, Golang, HTML5, CSS3, MATLAB, L^AT_EX , Excel, Git, Windows, MacOS	
PROJECT EXPERIENCE	Machine Learning Methods Implemented the following models from scratch, with little to no toolkits e.g. sklearn <ul style="list-style-type: none">❖ AdaBoost Decision Tree Classifier ensemble model❖ Pegasos algorithm for solving the soft margin Support Vector Machine primal problem, skipping the dual problem, with regularization & hinge loss❖ Soft margin SVM dual problem using a quadratic programming solver❖ Neural Network classifier with computation graph, Xavier weight initialization, and forward and backward propagation of matrix multiplication and addition, cross product, sigmoid, ReLU, and SoftMax❖ Convolutional Neural Network built upon NN classifier with forward and backward propagations for convolution, max pooling, and flattening filters❖ k-Nearest Neighbors with cross validation to optimize k❖ Linear Regression using gradient descent and cross-validated learning rates❖ Logistic Regression with regularization, normalized inputs, & gradient descent❖ Quadratic Weighted Kappa scoring function for ordinal logistic regression❖ Decision Tree Classifier with splitting on class and continuous attributes, information entropy, generalization error, and pruning	present
	Algorithms Wrote classes for the following algorithms with problem specific methods from scratch <ul style="list-style-type: none">❖ Graph Algorithms – BST, AVL Tree, Binary Min Heap, BFS, DFS, Dijkstra, Bellman-Ford, DAG shortest path, MST Prim, MST Kruskal, Max Flow Edmond Karp & Ford-Fulkerson❖ Sorting Algorithms – Heapsort, Quicksort, Mergesort, Insertion Sort❖ Data Structures – Coarse grained locking concurrent linked list, concurrent stack, concurrent queue, open addressing hash table, LRU cache❖ Dynamic Programming – LCS, LIS, Edit Distance, Knapsack, Coin Change, Word Break, Rod Cutting, Optimal Tree Placement, etc.	2021
	Slack Clone <ul style="list-style-type: none">❖ A single-page web application written with asynchronous JavaScript and Flask	2021

- ☛ Create account using an email and a password that is encrypted and hashed
- ☛ Includes features like “forgot password”, change username, change password, create new messaging channel, and reply to messages thread
- ☛ User info, channels, and messages are stored in database using SQL

Twitter Feed Clone

2021

- ☛ Handles adding and removing “tweets” to a coarse grained concurrent linked-list feed using a bounded concurrent queue lock implementation
- ☛ Talks to a server by decoding and encoding JSON files from strings

Other Projects

Pinterest Clone	Content Management System	Speaker Recognition System
Jack Programming Compiler	Blob Video Game	VM to Assembly Translator
Text Completion Software	Stock API Graph Generator	Authorship Text Verification
Roman Numeral Converter	Caesar Cypher File Encryptor	1 st Place Model Aircraft Flight

WORK EXPERIENCE

Aerospace Stress Engineer, Spirit AeroSystems Inc.

2016-2020

- ✕ Worked on teams that designed, built, analyzed, and tested aerospace structures for The Department of Defense, Boeing’s 787 Dreamliner, and Boeing’s 777X; gained promotion to Level II Stress Engineer within 18 months
- ✕ Applied knowledge of MATLAB, Excel, linear algebra, ABD matrices, statics, dynamics, fatigue, damage tolerance, crack growth, Finite Element Analysis, Computer-Aided-Design, and properties of aluminum and composite materials

Host of Glacier’s Bed and Breakfast

2018-2020

- ☛ Hosted guests in my 3-bedroom home with over 80 bookings
- ☛ Classified as a “Super Host” by Airbnb for sustaining a 5-star rating over two years

Fluid Dynamics Researcher, Syracuse University

2015-2016

- ✕ Studied the propulsive aspects of dolphin tails and experimented with 3D-printed dolphin caudal fins that mimicked swimming motion inside a water tunnel
- ✕ Synthesized knowledge of MATLAB, Excel, SolidWorks (CAD), 3D printing, Arduino, laser-induced fluorescence, HD videography, fluid dynamics, and circuits
- ✕ Used fluorescent dye and planar-shaped lasers to highlight trailing-edge vortices
- ✕ Constructed 3D vortex visualizations in MATLAB using pixel data from the HD recordings of the 2D vortex sheets by stacking and interpolating between points

CERTIFICATIONS

Secret Government Security Clearance	2020
Private Pilot	2019
Open Water Scuba Diver	2016

Last updated : 05/27/2021