

# Tal Erez

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## Education

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### Duke University

May 2025

*Master of Engineering* — Artificial Intelligence

Coursework: MLOps, Explainable AI, Sourcing Data for Analytics, Deep Learning, Modeling Process & Algorithms

### University of California, San Diego

March 2020

*Bachelor of Science* — Applied Mathematics

Coursework: Exploratory Data Analysis and Inference, Applied Linear Algebra, Computational Statistics, Graph Theory

## Skills

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**Languages:** Python, C/C++, Java, C#, Objective-C, JavaScript, Ruby, SQL

**Libraries:** Tensorflow, Scikit-Learn, Keras, NumPy, Pandas, PyTorch, Matplotlib, Selenium

**Technologies:** Git, PostgreSQL, Azure, Docker, AWS (S3, CloudWatch, Lambda, DynamoDB)

## Experience

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### Amazon, Remote | *Contract Software Development Engineer*

July 2022 – January 2023

- Migrated databases for the Related Accounts Presentation Service (RAPS), the service used to connect one merchant account to another across regions worldwide, preventing loss of data before deprecation of the previous storage service.
- Created alarms in AWS CloudWatch to monitor errors, fatal logs and CPU utilization thresholds for the RAPS service. This resulted in faster response times to service failures.
- Built a filtering method in Ruby to retrieve a merchant's compliance status within a designated timeframe for the internal website used to conduct seller investigations. This new approach eliminated the need to parse through a seller's full history and reduced investigation times.

### Shiver Entertainment Inc., Miami, FL | *Software Engineer*

July 2021 – July 2022

- Contributed to the development of Hogwarts Legacy in collaboration with Warner Bros. and Avalanche Studios for the PS4, XB1 and Nintendo Switch consoles using Unreal Engine. Selling over 24 million copies globally, Hogwarts Legacy became the #1 best-selling video game of 2023.
- Converted the codebase from Unicode to UTF-8, saving 250 MB of physical used memory as reported by automation tests.
- Altered the multi-thread framework of the game to efficiently pin threads to specific cores in order to reduce idle time on the Nintendo Switch platform. This improved the average frame rate by 10 ms per frame.
- Implemented an LOD system for game visual effects which reduced memory usage by an average of 100 MB and utilized Unreal Engine scripting to create an automated way of implementing the new system for all platforms.

### Kallos Studios Inc., Carlsbad, CA | *Software Engineer*

October 2020 – July 2021

- Supervised software development for all sectors of our PC, Android, iOS, VR and Hololens/AR platforms including UX/UI development, memory management and 3D simulation development.
- Created a recycler view framework for the PC platform. Benchmarking a reduction in size to large cache files by up to 25% and increasing the average FPS for these files from 2 fps to 20 fps.
- Streamlined the creation of animations in-engine by constructing a forward kinematics algorithm that automates construction vehicle joint movements needed to grab objects, eliminating the need for manual joint manipulation.
- Converted the company's VR platform from utilizing its own separate user interface to leveraging the software's PC interface, enabling users to switch platforms seamlessly.

## Research

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**Music-Mask AI:** Conducting research in generating imperceptible audio perturbations that safeguard artists' work from copyright infringement and unauthorized data scraping, aiming to mitigate the risk of AI mimicry.

**Multiple Sclerosis Classification:** Designing an early-onset predictive model for multiple sclerosis using data from functional electrical stimulation braces. Data is collected from IMUs for gait event detection and spatial orientation reconstruction, and EMGs.

## Projects

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**Deep Q-Learning Simulation:** Trained a reinforcement learning algorithm using Tensorflow to successfully complete landing simulations. Leveraged OpenAI's gymnasium library to create visual simulations of the model's performance.

**Improviz:** Developed a real-time voice to visualization AI. This system converts audio to voice transcriptions, uses embeddings to determine the most relevant topics from that transcription via clustering and creates visualizations of those topics in seconds.

**Adversarial AI Patch:** Created an adversarial patch targeted to fool the resnet34 model into classifying all images as a specific class. The patch is optimized using SGD by minimizing the cross-entropy loss between predictions and the target class.