JACOB COHEN

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- Resume available at https://jcgo.link/resume

PROFESSIONAL SUMMARY

An experienced Computer Science student at UIC (graduating May 2024) with over eleven months of full-time **non-internship** work experience and a **3.96 GPA**. Was a teaching assistant for three semesters. Currently doing undergraduate research on 3D University course-path visualization. Fascinated with cryptography, theory, and algorithm design.

WORK EXPERIENCE

FUNCTIONAL SAFETY INTERN 06/2023 to 08/2023
UL Solutions, Northbrook, Illinois.

- evaluated multiple clients' embedded software to certify compliance with UL Solutions' and International Electrotechnical Commission's standards.
- developed and delivered a strategic proposal to senior leadership advocating for the adoption of artificial intelligence to provide cost-effective client query resolution.
    - the proposal, backed by comprehensive supporting evidence and a detailed breakdown involving tech like Google's BERT and stochastic gradient descent, aimed to reduce reliance on pricier human engineers and position UL Solutions with a first-mover advantage in the market.

JUNIOR BACKEND SOFTWARE DEVELOPER (REMOTE) 03/2022 to 06/2022
Russian School of Mathematics, Newton, Massachusetts.
Added functionality to the school's web portal using Java, Log4j, Spring Boot, Lombok, and OpenAPI Swagger.
Committed to production unit-tested code to (non-inclusive)

- add additional server-side data validation & sanitation for fields *intended* to be passed via the web portal.
- add additional deserialization of Microsoft SQL database records to Java objects
- allow for filtering Java course objects (deserialized from Microsoft SQL DB) by new criteria (such as parent curriculums).
- use new filtering to update students' parents on changes to their child's classes' curriculums.

DEVELOPMENT OPERATIONS ENGINEER (REMOTE) 11/2019 to 05/2020
Russian School of Mathematics, Newton, Massachusetts.

- transferred large existing AWS infrastructure to sole control by Terraform (terraform.io) code-based management.
- leveraged pre-built tools such as terraformer (an incomplete solution at the time)
- wrote custom C++ programs with AWS API to generate terraform HCL (HashiCorp Configuration Language) syntactically correct configuration files.

- designed C++ tool for a final pass over the terraform HCL files confirming syntax validity and proper representation of active AWS infrastructure, then perform last-minute adjustments with regular expressions to fix errors or mismatches.

SKILLS

C / C++, Data Structures, Algorithms, Full Stack (PHP, HTML, CSS, JS, etc.), Java, Unity (C# and HLSL), Git CLI, mySQL / MariaDB, Apache2 & Nginx, JUnit Testing, RSA and OAEP

CS VOLUNTEERING

CREATION OF C# IMAGE UTILITY Summer 2018
Northwestern University Feinberg School of Medicine, Fawzi Lab
(fawzi.northwestern.edu)

- created C# tool to read machine-specific OCT (Optical Coherence Tomography), OCT-A (OCT Angiography), and XML data, then parse into a .tiff image stack.
- created C# GUI tool to manually read angles input over a blood vessel photo, allowing flow rate measurement.
- began programming automatic assessment of vessel blood flow through the OpenCV computer vision library.

UNITY DEVELOPER INTERN Summer 2016
Rehabilitation Institute of Chicago (now Shirley Ryan Ability Lab), James Patton's Lab

- wrote C# Unity3d code to receive and handle the UDP-transferred location information sent (through xPC Target) from the Proficio robot (robosklep.com/en/robotic-arms/135-robotic-arm-proficio.html).
- created software for real-time animation and rendering of a human patient's arm using inverse kinematics in Unity3D, which became this.
- made software usable for bettering patient recovery by allowing replacement of the patient's view with a position-altered rendering, allowing bettered analysis of nervous system damage.

EDUCATION

The University of Illinois at Chicago - Chicago, IL
Bachelor of Science: Computer Science (**3.96/4** Overall Institution GPA) 05/2024
CS Courses (UIC): Algorithms, Computer Design (Arduino), Systems Programming (C, Unix syscalls), Program Language and Design Implementation (F#, C#, mySQL), Software Design (Java, JavaFX UI), Languages and Automata, Machine Organization (x86 assembly), Data Structures (C++), Programming Practicum (C), Mathematical Foundations of Computing, Program Design Two (C++), Communication and Ethical Issues in Computing, Operating Systems Design and Implementation, Artificial Intelligence, Wearables and Nearables Technology

Teaching Assistant for Program Design II (141), Computer Design (362), and Machine Organization (261)

Ongoing Undergraduate Research under Professor Diana Diaz

- developing 3D student University path visualization browser tool which creates interactive 3D course graph using Unity project compiled to WebGL.

- developing C++ preprocessing tool to convert (while implementing in-depth data anonymization techniques) raw data into JSON which is used to generate the Unity graph scene.

NON-SCHOOL PROJECTS

Implemented the RSA Cryptosystem (with Optimal Asymmetric Encryption Padding) and Invented my own Hashing Algorithm

- projects are viewable on GitHub here and here.
- available to play around with (via Web Assembly) here.

rsa.jacobcohen.dev, GiftsBySarah.net, WestPoints.app, JacobCohen.info, MinEntropy.me, and jcgo.link

- designed the frontends and programmed the backends of many websites, including minentropy.me (currently under maintenance), jacobcohen.info (old portfolio), giftsbysarah.net (storefront for a business), westpoints.app (point tracking system for the United States Military Academy, *not* commissioned), and jclnk.io (quick-linking service). Learned much about web design, gained valuable experience setting up cloud Linux servers, integrating with Google's CDN, using public APIs via PHP's curl module, writing a custom-built Nginx configuration (including load balancer), and PHP, HTML, CSS, and JS.

Creation of paid & free server-side 'mods' distributed to 'Pixelmon Reforged' server owners and management of a public Minecraft server

2020

- developed and sold server-side modifications to the game code, utilizing existing APIs (Forge) and ASM JVM bytecode manipulation. One of these modifications (jclnk.io/MiniSafaris) has been run over 23,000 times on 275 unique IP addresses (each launch makes an HTTP GET request to a specific URI on my remote server). Managed and co-owned a relatively large Minecraft server in 2020.

Created HTTP-Controlled Power Relay for my Apartment Flip Switch

- I connect to lightswitch.jacobcohen.dev (proxied through CloudFlare to a Raspberry Pi on my home network). When I flip the virtual switch, the raspberry pi sends a plain-text HTTP packet to an ESP chip in my wall (wired through wall wart components to the 120V AC live and ground wires), which flips a power relay, turning on (or off) my front door lights.

Creation of personal, multipurpose toolkit at jacobcohen.dev

Ongoing

- feel free to ask for demonstrations during interviews.

SCHOOL PROJECTS

- some schoolwork is available at https://www.jacobcohen.info/github/, though no source code will be posted publicly until the assigning professor allows it.
- created PhoneToast, an Arduino project to let users know when their toast is ready, complete with HC-05 Bluetooth chip pairing, EEPROM use, a LAN-hosted configuration website, Twilio API text sending support, and a beautiful 3D-printed box.