

Karl M. Appel

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EDUCATION

Masters

Technology Commercialization & Entrepreneurship, Rensselaer Polytechnic Institute, 2015

Bachelor of Science

Computer Science, Siena College, 2014

EXPERIENCE

President - Kappel Tech INC - January 2024 - Present

- Worked on advanced AI-driven diagnostics and optimization for clients.
- Implemented local LLMs (e.g., Qwen, Deepseek) for chatbots to enhance issue-solving capabilities in critical applications.
- Expertise in hardware-software integration, including embedded systems, 3D printing, and edge computing for real-time processing.
- Assisted companies in confidential projects under strict NDAs, focusing on cutting-edge AI and hardware advancements.

Co-Founder & VP of Operations - Royale Flower Dispensary – August 2022 – February 2025

- Over Oversaw all daily operational functions, including inventory management, staff scheduling, and compliance with state cannabis regulations.
- Led implementation and maintenance of the Dutchie POS system, streamlining sales tracking, inventory reconciliation, and customer data management.
- Directed vendor relations, negotiating supply agreements, managing purchase orders, and ensuring timely delivery of cannabis products and accessories.
- Coordinated logistics, financial reporting, and employee oversight, ensuring operational efficiency and legal compliance across all departments.
- Integrated technology systems to automate workflows and optimize business intelligence.

Lead AI Software Engineer - FlowActive - January 2017 - May 2025

- Developed embedded software for IoT devices utilizing machine learning algorithms, specifically recurrent neural networks (RNNs), for leak detection in toilets.
- Implemented neural networks using large language models (LLMs) such to analyze patterns in leak detection across buildings.
- Designed architecture for real-time IoT data streams using AWS services.
- Developed user interfaces with ReactJS and Electron apps, integrating APIs and Raspberry Pi devices to sync with custom machine learning pipelines.
- Managed API development and database interfacing using MySQL, optimizing backend systems for performance and scalability.
- Contributed to grant applications, securing \$1,250,000 in SBIR funding from the NSF.

Software Developer - Uppmarket - January 2023 - July 2023

- Engineered AI-powered web scraping solutions using tools like BeautifulSoup and Scrapy, enhanced with NLP techniques for data aggregation.
- Used OpenAI API with GPT3.5 to create algorithms for data scraping.
- Designed scalable scraping systems optimized for performance and accuracy, leveraging machine learning models for pattern recognition.
- Built custom automation tools for data extraction, processing, and analysis, utilizing Python libraries such as Pandas and NumPy.

Co-Founder - Intelligent Retrieval - June 2014 - April 2018

- Developed custom AI software solutions, including machine learning algorithms for data analytics and decision-making.
- Designed a suite of e-commerce tools utilizing AI-driven recommendations and predictive analytics.
- Provided data analytics consulting, employing techniques like clustering and classification to derive actionable insights.

CERTIFICATIONS

PMP (License 2100920): October 2017 - Present

PATENTS

Fluid flow probe and analysis

- US 11391615B2 · Issued Jul 19, 2022

Fluid flow sensor system having a universal stem

- US 11015968B2 · Issued May 25, 2021

RESEARCH PROJECTS/PUBLICATIONS

Siena Twitter Information Retrieval System: May 2011 – Spring 2013 (STIRS)

- Used Java/Lucene to create a search engine for Twitter Tweets for NIST Competition.

10 Weeks to TREC: STIRS, Siena's Twitter Informational Retrieval System. The Twentieth Text Retrieval Conference Proceedings, (with D. Lim, S. Small, K. Appel, D. Kalic, M. Kemmer, D. Purcell, C. Tompkins, C. Tran). Gaithersburg, Maryland, November 15-18, 2011.

- Paper describing work for Twitter Tweets NIST Competition, 2011.

Siena Twitter Information Retrieval System: The 2012 Micro-blog Track. The Twenty-First Text Retrieval Conference Proceedings, (with D. Lim, S. Small, Karl Appel, Lauren Mathews). Gaithersburg, Maryland, November 6-9, 2012.

- Paper describing work for Twitter Tweets NIST Competition, 2012.

PROGRAMMING TECHNICAL SKILLS

General Use: Python, JavaScript, Java, Amazon Web Services (AWS)

Apps: Swift, Kotlin, React Native

Backend: PHP, Ruby, Swift

Databases: PostgreSQL, Amazon DynamoDB, MongoDB

Embedded: C, C++

OS: Windows/Linux/OS X

VOLUNTEER WORK

Supervisory Committee Member, Sunmark Federal Credit Union: May 2016-May 2023

- Inspects the securities, cash and accounts of the credit union and supervise the acts of its board of directors, officers and credit committee
- Address Member Complaints
- Managed and Handled Notes as Secretary in Meetings