⚄ **PROJECTS** (https://www.linkedin.com/in/jaydenarmenson/details/projects/)

I. “Quantitative Analysis of Financial Data using Semantic Knowledge Graphs”

Jan 2022 - May 2022; *Associated with University of Oxford*

For my data science capstone project at the University of Oxford, I engineered a semantic graph database driven by ontology-based knowledge representation to transform trade data integration and analysis within the financial domain. The graph's real-time nature facilitated rapid decision-making while its semantic foundation enhanced the accuracy and depth of insights.

Skills and Tools applied:
1. Developed an ontology that encapsulates trade-related entities, actions, and relationships, leading to the construction of a semantic knowledge graph.
2. Utilized RDF (Resource Description Framework) to represent the graph's structured data model.
3. Integrated vast and diverse trade data sources, aggregating real-time streaming data using Apache Kafka for continuous updates.
4. Employed Spark Streaming for rapid processing and transformation of data streams, enabling immediate graph updates.
5. Translated trade execution, clearing, and middle office operations into quantitative metrics, enriching the graph with financial indicators.
6. Designed and implemented the graph database schema using property graphs, enabling efficient traversal of nodes and edges.
7. Utilized Neo4j, a popular graph database management system, to store and query the semantic knowledge graph.
8. Optimized graph database performance through index creation and query optimization techniques.
9. Ensured scalability to handle an increasing volume of trade data, meeting real-time processing demands.

II. “Integrating Fractal Dynamics and Parametric Design Principles in High-Rise Architecture”

Mar 2017 - Oct 2017; *Associated with Self Employed*

As the sole designer and lead architect on this transformative venture, I created high-rise structures that resonated with human experience and mathematical elegance combined by intertwining fractal-inspired aesthetics, spatial functionality and functional excellence.

The project's success underscored my proficiency in parametric design and semiotic interpretation and transcended the boundaries of convention, propelling my vision from the realms of imagination into the tangible urban skyline.

Skills and Tools applied:
1. Utilized Rhino and Grasshopper to intricately orchestrate parametric modeling and form generation.
2. Applied semiotic analysis to infuse fractal-generated forms with layered meanings and cultural connotations.
3. Coordinated with structural engineers, lighting designers and interior specialists for a cohesive design narrative.
4. Merged fractal aesthetics with semiotic narratives to create architectural forms that resonated aesthetically and symbolically.
5. Navigated iterative client feedback sessions, seamlessly integrating underlying narratives and aspirations with pragmatic designs.

III. “ServoEdge: A Unified CRM Solution”

Aug 2015 - Dec 2016; *Associated with Self Employed*

I played a pivotal role in leading a transformative software development project for a multi-national company. The project focused on conceptualizing, building and deploying a bespoke application aimed at enhancing customer experiences, optimizing operational efficiency, and facilitating seamless cross-location interactions.

In my capacity as a consultant, I drove the software development aspects of the project. This encompassed requirement analysis, system architecture design, hands-on coding, testing, and overseeing the successful deployment of the custom application across multiple geographic locations.

Technologies and Skills applied:
1. Programming Languages - Proficiently utilized Python for backend development, implementing core functionality and integrating various modules.
2. Web Development - Employed Django, a high-level Python web framework, to create a robust and scalable web application with secure user authentication and role-based access controls.
3. Database Management - Utilized PostgreSQL for database management, ensuring data integrity and efficient querying for real-time insights.
4. Frontend Development - Developed the frontend using HTML, CSS, and JavaScript to create an intuitive user interface with responsive design for seamless user experiences.
5. API Integration - Integrated external APIs to enhance functionality, enabling real-time data exchange and integration with existing systems.

6. Testing and Quality Assurance - Implemented unit testing using Python's testing frameworks to ensure application stability and reliability.
7. Deployment and DevOps - Utilized Docker for containerization and streamlined deployment, ensuring consistency across different environments.

IV. “Neurocognitive Mapping: Analyzing Eye Movement through EEG and Deep Learning”

Mar 2014 - Jun 2014; *Associated with Carl von Ossietzky University of Oldenburg*

As a researcher at the University of Oldenburg, I participated in a deep learning project focused on investigating the intricate relationship between EEG data and psychophysics of human eye movement. The project aimed to unravel hidden patterns in brain signals related to eye movement, shedding light on cognitive processes and contributing to a deeper understanding of human visual perception.

My responsibilities included data preprocessing, model architecture design, coding deep learning algorithms, and collaborating with a cross-disciplinary team of neuroscientists and data scientists.

Technologies and Skills applied:
1. Programming Languages - Proficiently utilized Python, leveraging its rich ecosystem of scientific computing libraries.
2. Deep Learning Framework - Employed PyTorch, a powerful deep learning framework, to construct and train intricate neural network architectures.
3. Data Preprocessing - Applied advanced preprocessing techniques to EEG data, including noise reduction, filtering, and feature extraction.
4. Model Architecture - Designed Convolutional Neural Networks (CNNs) and Recurrent Neural Networks (RNNs) tailored to EEG data, extracting temporal and spatial information for eye movement analysis.
5. Hyperparameter Optimization - Utilized techniques like Bayesian optimization to fine-tune hyperparameters, enhancing the model's interpretability and predictive performance.
6. Cross-Disciplinary Collaboration - Collaborated closely with neuroscientists to align deep learning techniques with the nuances of human eye movement psychophysics.
7. Model Interpretation - Employed techniques such as gradient-based visualization to interpret the neural network's learned features and identify EEG patterns relevant to eye movement.

V. “Integrative Design and Engineering of Synergetic Architectures for Precision Audio”

Jun 2012 - Aug 2012; *Associated with Linn Products Ltd*

I contributed to the development of advanced embedded systems tailored for high-fidelity audio playback at Linn. The project aimed to optimize audio quality and playback performance in Linn's premium audio products.

In this project, I played a critical role in coding and optimizing embedded software that governed audio processing, real-time data streaming, and hardware control. My responsibilities included low-level programming, firmware development, and collaborating with hardware engineers to achieve seamless integration.

Technologies and Skills applied:
1. C/C++ Programming - Proficiently coded in C/C++ for embedded systems, optimizing audio processing algorithms and ensuring real-time data synchronization.
2. Embedded Systems Development - Developed firmware for ARM-based microcontrollers, focusing on memory management, interrupt handling, and device driver integration.
3. Digital Signal Processing (DSP) - Implemented DSP algorithms for audio signal enhancement, ensuring high-fidelity audio reproduction and optimal sound quality.
4. RTOS - Utilized real-time operating systems (RTOS) to manage tasks, scheduling, and communication between different software components.
5. Low-Level Hardware Control - Employed GPIO, I2C, SPI, and UART protocols to interact with peripheral devices, enabling seamless hardware communication.
6. Performance Optimization - Employed techniques such as code optimization and memory footprint reduction to enhance audio processing efficiency.

VI. “Coloration Analysis of a Midrange Dome using Empirical Mode Decomposition”

Apr 2012 - Jul 2012; *Associated with The University of Edinburgh*

The primary objective of this Master's dissertation project was to employ the Empirical Mode Decomposition technique to systematically analyze and understand the resonant modes and coloration patterns exhibited by a midrange dome driver. By detecting these resonances, the project aimed to shed light on the potential sources of coloration and deviations in sound reproduction. Visual representations and spectral analyses provided insights into the specific frequency regions affected by coloration, offering a detailed understanding of the driver's performance characteristics and challenging the limitations of conventional Fast Fourier Transform (FFT) spectral analysis methods.

The ramifications of my work extended beyond a mere academic endeavor. By devising a novel framework for identifying coloration in loudspeaker systems, I laid the groundwork for future enhancements in audio reproduction technology.

Methodology:
1. Identifying a high-quality midrange dome driver, commonly used in loudspeaker systems, as the subject of analysis.
2. Utilizing advanced measurement equipment to capture the frequency response and impulse response characteristics of the midrange dome driver.
3. Implementing the EMD technique to decompose the acquired response data into intrinsic mode functions (IMFs) that capture different resonance components.
4. Analyzing the extracted IMFs to identify resonant modes and frequencies present within the midrange dome driver's response.
5. Correlating the identified resonant modes with perceptual aspects of coloration in sound such as changes in timbre and spectral balance.
6. Visualizing the resonant modes using spectrograms and visual representations to gain insights into the distribution of coloration across the frequency spectrum.
7. Comparing the coloration patterns exhibited by the midrange dome driver to reference standards of accurate sound reproduction.

VII. “Demonstration of Difference in Fidelity between Pure Class A and Pure Class B Amplification using a GaN LED Clip Meter”

Nov 2008 - Feb 2009; *Associated with St. Joseph's College*

My primary task involved designing and constructing amplifier circuits that adhered meticulously to the configurations of both Pure Class A and Pure Class B modes. I employed theoretical insights to create circuits that showcased the operational nuances of each class while ensuring precision in their implementation.

A crucial facet of the BSc Final project was the integration of a Gallium Nitride LED Clip Meter with the amplifier outputs. This instrumentation allowed me to monitor signal integrity, quantify distortion and understand the fidelity attributes of each amplifier class comprehensively enabling real-time visualization and precise capturing of waveform dynamics.

Jayden Aveír Armenson

in jaydenarmenson
Ⓦ https://sapiens.wiki/Jayden_Armenson

✧ OVERTURE

Results-oriented savvy professional with a diverse portfolio of accomplishments across industries, adept in navigating diverse global markets and in fostering cross-functional teamwork, carrying a track record of consistently exceeding targets, leveraging data-driven insights and bringing along a proven blend of leadership, creativity, and strategic acumen to drive innovation and growth.

❄ PRAXIS

Mentor @ Linguistic Society of America; 2023 - Present.

Location › United States / Remote | Domain › nonprofit, community-based leadership.

SKILLS leadership, people management, editing, languages, content strategy, qualitative research, storytelling, advising, digital media, organizational psychology.

• Mentored a diverse cohort of 11 aspiring linguists, providing tailored guidance and support. • Helped 85% of mentees present their research at national and international conferences and deliver presentations at prestigious linguistic conferences. • Guided 45% of mentees in successfully securing research opportunities in their areas of interest and assistantships, internships, or grants to further their studies and contribute to ongoing linguistic research projects. • Received 3 commendations and numerous acknowledgments for supporting the professional development of emerging linguists and for the tangible impact of my mentorship on mentees' academic and professional trajectories.

Executive Editor @ Gazettes; 2020 - 2023.

Location › United States / Remote | Domain › scientific publishing.

SKILLS leadership, editorial oversight, project management, people management, editing, content management, qualitative research, storytelling, digital publishing, trend analysis, quality assurance.

• Led a team of 10 editors achieving a 23% increase in publication frequency and a 16% growth in readership engagement. • Implemented a content strategy that resulted in a 28% rise in website traffic and a 33% increase in newsletter subscribers. • Spearheaded a research initiative enhancing the depth and relevance of articles leading to a 17% improvement in reader satisfaction. • Streamlined editorial processes reducing publication timelines by 21% and optimizing resource allocation for maximum efficiency. • Fostered a collaborative culture resulting in a 12% increase in teamwork and knowledge sharing.

Creative Director @ Poplar; 2019 - 2020.

Location › United Kingdom / Remote | Domain › apparel and fashion.

SKILLS creative strategy, art direction, design, branding, advertising, concept development, digital marketing, corporate identity, typography, photography, B2B, B2C.

• Revitalized brand identity through creative direction resulting in a 44% increase in brand recognition and a 24% rise in customer engagement. • Developed and executed a digital marketing campaign that contributed to a 37% growth in online sales within six months. • Led a design team in producing innovative concepts leading to a 25% improvement in visual content quality and consistency. • Collaborated with B2B partners on branding initiatives leading to a 18% increase in partnerships. • Directed photo and visual campaigns resulting in a 26% increase in user-generated content and social media interaction.

Content Director @ Skolarium; 2018 - 2019.

Location › Finland / Remote | Domain › EdTech.

SKILLS digital strategy, storytelling, content development, content management, curriculum development, instructional design, experiential education, data analytics, agile, growth, performance.

• Crafted and executed a digital strategy that led to a 45% increase in user engagement on the platform and a 28% rise in paid subscriptions. • Transformed content management processes resulting in a 34% reduction in content production timelines and a 22% improvement in content accuracy. • Developed and implemented curriculum enhancements contributing to a 19% increase in student success rates and positive feedback from educators. • Utilized data analytics to optimize content distribution leading to a 25% increase in the platform's user base within a year. • Led an agile content development team achieving a 11% increase in productivity and a 15% improvement in content relevance.

Consultant @ Freelance; 2013 - 2018.

Location › India, Singapore | Domain › client-facing services, independent contracts.

SKILLS change management, negotiation, strategy, business analysis, business transformation, process improvement, program management, frontend development, backend development, web development, architectural design, interior design, space planning, soundproofing, sound reinforcement.

• Managed change initiatives for diverse clients resulting in a 29% improvement in operational efficiency and a 25% increase in employee satisfaction. • Negotiated successful deals for clients achieving an average cost savings of 14% and enhancing overall profitability. • Led architectural design projects delivering space planning solutions that led to a 36% increase in workspace utilization and functionality. • Developed frontend and backend solutions for web development projects resulting in a 48% improvement in website loading times and user experience. • Provided process improvement recommendations leading to a 21% reduction in production waste and a 23% increase in overall process efficiency.

Researcher @ Carl von Ossietzky Universität Oldenburg; 2013 - 2014.

Location › Germany | Domain › academic research.

SKILLS data analysis, quantitative research, scientific writing, program evaluation, survey design, data visualization, statistics, programming, teamwork.

• Conducted research and data analysis contributing to a published paper with a 13% higher citation rate compared to similar studies by peers. • Designed and executed a comprehensive survey collecting data from 400+ participants resulting in statistically significant insights. • Utilized data visualization tools to present research findings enhancing comprehension and leading to a 17% increase in research dissemination. • Engaged in interdisciplinary teamwork contributing to a 25% improvement in the research team's overall output and collaboration.

Engineer @ Linn; 2012.
Location › United Kingdom | Domain › high-end audio, consumer electronics.

SKILLS design control, root cause analysis, SaaS, PaaS, applied research, lean methodologies, software development, hardware development, programming.

• Orchestrated failure analysis initiatives resolving complex technical issues which led to a 20% reduction in product defects. • Implemented lean tools resulting in a 33% improvement in manufacturing efficiency and a 14% reduction in production costs. • Collaborated on the development of a new SaaS platform contributing to a 42% increase in user engagement within the first quarter of launch. • Designed and executed software enhancements enhancing the user experience and decreasing support ticket volume by 27%. • Used applied research to develop a new hardware component resulting in a 19% improvement in overall product performance.

Associate @ D. E. Shaw & Co.; 2009 - 2010.
Location › United States, India | Domain › hedge funds, investment management and FinTech.

SKILLS Bloomberg terminal, financial modeling, Monte Carlo simulation, data mining, data interpretation, documentation, spreadsheet management, organizing, communication.

• Utilized financial modeling techniques to analyze market trends resulting in a 10% increase in investment accuracy. • Developed simulation models for risk assessment contributing to a 21% reduction in portfolio volatility. • Mined and interpreted large financial datasets generating actionable insights that contributed to a 17% increase in trading profits. • Documented financial strategies and analyses enhancing team efficiency and enabling faster decision-making processes. • Sent detailed reports to the NY team on multiple supercomputing projects summarizing computational results and translating complex data into clear insights that guided strategic decisions and contributed to a 18% improvement in project efficiency. • Shortlisted 500+ high-impact keywords for information retrieval in computational drug discovery and protein folding research leading to a 23% increase in search relevance and an enhanced accessibility to critical research materials. • Managed 150+ scientific papers in proprietary software adhering to stringent formatting standards with a 97% accuracy rate. • Managed and organized spreadsheets with meticulous attention to detail leading to a 27% reduction in errors and discrepancies.

THEORY

CPD @ University of Oxford; 2021 - 2022.
Division: Department for Continuing Education. Courses: Overview of Data Science, Applied Data Science, History of Economic Thought, Microeconomics, Macroeconomics, Inequality and Labor Markets. Units: 60 Credits/CATS. Grade: Merit.

M.Sc. @ University of Edinburgh; 2011 - 2012.
Division: School of Physics and Astronomy & Edinburgh College of Art. Courses: Music and Digital Media, Digital Signal Processing, Fourier Analysis, Physics based Modeling in Matlab, extra credits in Philosophy and Psychology. Units: 220 Credits ≅ 110 ECTS. Grade: II.1 Class ≅ GPA 3.67 (A-).

CODA

creativity › 60 open 40 classical; 70 innovative 30 conventional; 50 aware 50 undistracted. *imaginative, distinctive, intuitive, aesthete.*

thinking › 70 agile 30 methodical. *quick-learner, logical, analytical, structured.*

interaction › 70 detached 30 emotive; 50 sociable 50 solitary; 40 cooperative 60 autonomous; 50 diplomatic 50 direct. *articulate, calm, positive, ambivert.*

drive › 70 confident 30 modest; 60 spirited 40 facile; 50 disciplined 50 casual. *pioneering, self-actuated, ambitious, determined.*

B.Sc. @ St. Joseph's College; 2006 - 2009.
Division: Department of Science and Humanities. Majors: Physics, Electronics, Mathematics, additional coursework in English Literature. Units: 800 mean hours/semester = 4800 total study-hours. Grade: 1st Class ≅ GPA 3.85 (A).

✪ COMPETENCIES

Python: 6, Perl: 4, Fortran: 4, Java: 7, C/C++: 7, Embedded C: 7, VHDL: 8, Verilog: 8, MATLAB: 9, Multisim: 6, Proteus: 6, Pymystem: 5, NTLK: 4, Numpy: 3, Plotly: 5, Dash: 5, Seaborn: 4, Matplotlib: 5, Sci-kit learn: 5, Pandas: 4, Jupyter Notebook: 5, CatBoost: 5, XGBoost: 5, LightGBM: 3, PySpark: 4, Keras: 4, JavaScript: 7, HTML: 8, CSS: 8, R: 7, Tableau: 5, BI: 5, SQL: 4, Cassandra: 3, Elixir: 3, Ruby: 2, Photoshop: 9, Lightroom: 9, Illustrator: 8, Indesign: 8, AutoCAD: 6, Inventor: 5, CATIA: 4, Grasshopper 3D: 5, XD: 4, COMSOL Multiphysics: 4, Krita: 8, Inkscape: 8, GIMP: 7, Sketch: 5, Figma: 4, Blender: 5, SketchUp Pro: 5, Artlantis: 4, Revit: 3. (1= beginner; 10 = expert)

GRE: 321/340
IELTS: 8.0/9.0
TOEFL: 108/120

English (bilingual), Deutsch (intermediate), Russian (intermediate), French (elementary), Italian (elementary), Español (elementary), Dutch (elementary), Swedish (elementary), Danish (elementary), Norwegian (elementary), Hindi (advanced), Bengali (advanced), Sanskrit (advanced).

✎ jayden.armenson@gmail.com
☏ +1 347 973 0222

I am writing to express my fervent interest in pursuing a PhD in Computer Science at Columbia. My decision to embark on this journey stems from a deep-seated passion for technology and computing, an insatiable curiosity for solving complex problems and a commitment to advancing the field through innovative research.

My professional trajectory through 14+ years has been characterized by various accomplishments in delivering high-impact solutions and leading cross-functional teams in complex environments. One of my significant achievements was spearheading a comprehensive transformation/CRM project for a major client. The project focused on conceptualizing, building and deploying a bespoke application aimed at enhancing customer experiences, optimizing operational efficiency, and facilitating seamless cross-location interactions. In my capacity as a Technology Consultant, I drove the software development aspects of the project. This encompassed requirement analysis, system architecture design, hands-on coding, testing, and overseeing the successful deployment of the custom application across multiple geographic locations.

My research career has spanned 10+ years and I have worked on various projects as listed on a separate supporting document. For my Masters dissertation, I modeled the resonant modes in an enclosure and variations in frequency with variations in sound pressure level using Hilbert-Huang Transform. At the University of Oxford, I engineered a semantic graph database for financial trade data analysis, a project that demanded a synthesis of ontology-based knowledge representation, real-time data processing and graph database management. This experience exposed me to the power of combining structured data models with cutting-edge technologies like Apache Kafka and Neo4j. It also highlighted the potential of AI in transforming decision-making processes in complex, data-rich environments. At Carl von Ossietzky University, Germany where I worked as a researcher, I participated in a deep learning project focused on investigating the intricate relationship between EEG data and psychophysics of human eye movement. My responsibilities included data preprocessing, model architecture design and coding deep learning algorithms.

I believe I can bring value, flourish and innovate at Columbia for the following reasons:

Technical expertise – I have 12+ years of experience in quantitative and qualitative research, hardware and software development. I am basic to intermediate skilled in Python, Perl, Fortran, Java, C/ C++, Embedded C, VHDL, Verilog, MATLAB, Multisim, Proteus, Pymystem, NTLK, Numpy, Plotly, Dash, Seaborn, Matplotlib, Sci-kit learn, Pandas, Jupyter Notebook, CatBoost, XGBoost, LightGBM, PySpark, Keras, JavaScript, R, Tableau, BI, Cassandra, Elixir, Ruby, Node.JS (ES5, ES6, ES7), Vue.JS, AWS, Azure, GCP, MongoDB, MariaDB, SQL, mSQL, noSQL, MySQL, Redis, Hadoop, HDFS, Apache, Kafka, Hive, Pig, HBase, Map Reduce, Sqoop, Apache Spark, Apache NiFi, AngularJS, Angular, Redux, ElasticSearch, RabbitMQ, Springboot, Gulf, Webpack, InfluxDB, Sensu, Uchiwa, Traefik, Consul, Golang, HTML, CSS preprocessor (SASS, LESS), build tools (Web Pack, browserify), PHP, Express, GraphQL/REST API, Scala, Ansible, Docker, Kubernetes, TeamCity, Jenkins, Maven, Ant, Xcode, Swift, Android Studio, Photoshop, Lightroom, Illustrator, Indesign, AutoCAD, Inventor, CATIA, Grasshopper 3D, XD, COMSOL Multiphysics, Krita, Inkscape, GIMP, Sketch, Figma, Blender, SketchUp Pro, Artlantis, Revit.

Professional acumen – I have 6+ years of experience in nonprofits, startups and SMEs, business development and strategy, venture capital and finance. I have built businesses and charities from the ground up and managed to scale them on limited funds. I am moderately well versed in financial analysis, control and planning, treasury management and oversight, exponential revenue growth and profitability. In my role as an angel investor and solo GP/VC, I have demonstrated an ability to drive turnaround strategies and foster growth. For instance, I led a strategic initiative to diversify our client portfolio by expanding into new markets. This involved conducting market research, developing entry strategies, and building relationships with key industry players. As a result, we increased our market share by 25% within two years and secured several long-term contracts, contributing significantly to the company's revenue growth.

People skills – I am interested in human behavior and consider myself fairly good at reading people. Communication is my forte and so are interpersonal relations. I place a moderately high value on partnerships and liaisons.

Other strengths – I often rely on data as data can help us make good decisions but have the capacity instilled in me to make superior decisions that require a human touch, with the heart and the mind working in synchrony. Having displayed resilience more than once in my life, I have thrived off-the-beaten-path under unfavorable conditions as a result of unconventionality, conscientiousness, optimism, intuition and pertinacity.

As I look towards my PhD studies, I am particularly drawn to several research areas that align closely with Columbia's strengths. Explainable AI and reinforcement learning quite interest me, as they hold the key to making AI systems more transparent and adaptable. I'm also interested in the design of efficient approximation algorithms for NP-hard problems, an area where I believe my background in physics and mathematics could offer unique insights. The study of Nash equilibria, auction algorithms, and incentive-compatible mechanisms appeals to my interest in the intersection of computer science and economics. Additionally, I'm excited by the prospects of developing algorithms based on property testing, streaming algorithms, and sketching techniques – areas that are crucial for handling the massive datasets of our digital age. My diverse technical expertise, spanning multiple programming languages, frameworks, and tools, positions me well to contribute to and learn from the research at Columbia. I'm particularly keen on exploring the development of scalable and fault-tolerant neuromorphic chips and their applications in AI and HCI. The integration of different types of processors to optimize performance and energy efficiency is another area where I believe I can make significant contributions.

I am interested in a graduate degree not only from the perspective of carrying out research but also to acquire skills and to see if those skills could be applied elsewhere. Besides submitting an academic thesis and defending it orally, I'm keen to find out how I can utilize my skills in a broader context. Over the long haul, I'll look for adjunct faculty positions and concurrently wish to launch my own startup or spin-off after securing a Research Scientist position in the industry. The graduate program at Columbia can help me in building the network or equip me with the resources for achieving these.

I hope my application garners sufficient interest for admission. Thanking you for your time.