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Marko Bachvarovski

github.com/markobachvarovski
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Education

University of Toronto September 2019 - June 2024

Honors Bachelor of Science (HBSc) with Distinction, major in Physics, minor in Computer Science

Skills

- **Languages** | JavaScript, TypeScript, Python, C++, HTML5, CSS3, Java, C, R
- **Frameworks/Libraries** | Node.js, Express.js, PostgreSQL, MongoDB, REST, GraphQL, JSON RPC, Redis, Docker, Kubernetes, Django, React.js, Bootstrap, AWS, Jest, Postman
- **Other** | Git, Github, Microservice, Distributed Systems, CI/CD, Unix, Jira, Confluence, Subversion, Heroku

Work Experience

Insurance Systems Inc. Toronto, ON
Software Engineer June 2023 - Present

- Developed a platform-wide premium reduction algorithm without negatively impacting the Client's revenue by lowering the premium based on the broker commission percentage, enabling users to generate tailored quotes which increased the quote conversion rate by 10%
- Collaborated with cross-functional teams to enable the integration of a previously unsupported policy type by implementing custom workflows to simplify client-specific processes such as policy underwriting and migrate data from pen-and-paper records to a digital platform
- Automated repetitive workflows, such as policy renewals, by leveraging internal job scheduling tools to efficiently process recurring renewals in batch, saving over 160 hours of manual labor to date, improving operational efficiency and reducing errors in routine processes
- Maintained a write-behind cache to reduce database writes by frequently updating the cache in real-time, ensuring strong consistency with client-side changes necessary for executing business logic, enabling accurate premium generation and data processing
- Led the development of the policy management feature on new project implementation, working closely with senior leadership to align with strategic goals, consistently receiving positive feedback for delivering a user-centric solution, and contributing to the project's overall success

Software Engineer Intern May 2022 - August 2022

- Remediated a critical defect in the Main branch that was blocking a client release by identifying and fixing a function recognition bug, enabling a successful and timely release, resulting in an increase of 80% in client satisfaction
- Resolved a complex edge case in the minimum premium distribution process by adapting the algorithm to handle dynamic user inputs, such as premium overrides and non-standard configurations, leading to a more fault-tolerant distribution process and a decrease in errors by 10%

Personal work and projects

Savi Finance (Startup) Remote, Toronto, ON
Software Engineer January 2023 - Present

- Architected a highly scalable notification microservice using Amazon SNS, employing a fan-out pattern architecture to handle concurrent requests across distributed nodes and a dead-letter queue to manage failed message deliveries, achieving a 99.9% delivery success rate
- Designed a distributed queue-worker solution using Amazon SQS to streamline asynchronous task processing across the platform, automating repetitive processes, such as recurring transaction logging, to improve operational efficiency and reduce manual effort by 95%
- Built an innovative group transaction split feature, enabling up to 10 users to join a group and split shared transactions, seamlessly integrating transaction tracking, automatic balance adjustments, and real-time updates, resulting in a 70% increase in user approval rating
- Engineered the first distributed job execution pipeline to match vendors, reducing manual workload by 75% and increasing efficiency in the vendor matching process by implementing a retrieval algorithm based on the Levenshtein distance to match vendors to user input accurately

ShakespeareGPT Remote, Toronto, ON
Generative Pre-trained Transformer Project May 2024 - June 2024

- Implemented a generative pre-trained transformer (GPT) trained on an extrapolation of Shakespeare's play "The Tempest", incorporating tokenization, language modeling, loss estimation, and token generation abilities to produce coherent text resembling Shakespeare's style
- Optimized model by implementing advanced optimization methods including a self-attention mechanism, a feedforward layer, residual connections, layer normalization, and dropout techniques to enhance the performance of the GPT by reducing loss by 57%

NellieBot Remote, Toronto, ON
NBA Chatbot Project April 2024

- Integrated a retrieval-augmented generation (RAG) capability to dynamically handle user queries by generating a SQL queries based on user input, storing relevant game data into a SQL database with provided NBA games, and allowing users to request specific games for retrieval
- Implemented a natural language memorization ability, enabling Nellie to contextually recall and process user requests based on previous interactions, enabling users to make queries without providing crucial information multiple times, enhancing user convenience and ease of use