Bowen Dai

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Skills

- **Programming Languages:** C, C++, Python, Java, JavaScript, HTML, CSS,
- **Technologies:** Git, Linux, LaTeX, VScode, Vim, IntelliJ, Pycharm, Excel, Unity, Microsoft

Projects

- **Online Portfolio | HTML, JavaScript, CSS** [🌐] [GitHub] *January 2025*
  - A **responsive** and **interactive** personal **website** to display my projects and allow visitors to leave messages and contact information
- **Autonomous Robotic Chess Board | C, JavaScript, Socket.IO** [GitHub] *November 2024*
  - Designed and implemented a robotic chessboard that detects, tracks, and moves chess pieces using a **CoreXY pulley system** integrated with Stockfish chess engine for **AI-driven gameplay**
  - Built a **matrix circuit** with 64 hall-effect sensors to track chess piece positions in real-time, optimizing GPIO pin usage on a **Raspberry Pi**
  - Developed a pathfinding algorithm using **Breadth-First Search** (BFS) to calculate the **optimal paths** for moving pieces, including obstacle management
  - Programmed communication between hardware and software via **Socket.IO** and **Foreign Function Interface** (FFI), connecting C-based hardware controls with a web interface
  - Created a **responsive web application** using HTML, CSS, and JavaScript to display live game updates
- **RSA Encryption and Decryption | Python** [GitHub] *June 2024*
  - Designed and implemented a **RSA** encryption system, including prime number generation, public/private key generation, and encryption/decryption algorithms
  - Implemented **text-to-UTF8** encoding and **block-based** encryption to handle large text inputs
  - Used **modular programming** techniques to ensure reusable and maintainable code for cryptographic operations
  - Generated key pairs of **varying lengths** based on user-defined input, ensuring **adaptability** for different encryption requirements
  - Created a user-friendly **menu interface** for operations such as encryption, decryption, and RSA setup, accommodating user input validation and error handling

Work Experience

- **Teaching Assistant: Programming in Science, Calculus 1 [🌐]** *August 2024 - present*
  - Provided constructive and timely feedback to **60+** students each week, identifying areas for improvement and clarifying any misunderstandings.
- **Peer/Alumni Tutor for Calculus 1, 2 and Modern Physics [🌐]** *August 2023 - Present*
  - Lead **1 hour** tutoring sessions each to **2 CEGEP students** per semester

Honors and Awards

- **Ranked in top 25% in** *May 2024, May 2023, May 2024*
  - Senior and Junior Canadian Computer Competition
  - Canadian Senior Mathematics Contest
- **3rd Place in business case competition** *September 2023*

Education

- **Bachelor of Applied Science: Software Engineering | Average 96%** *August 2024 - Present*
  - President's Scholarship