# GABRIELA M. BALISACAN

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GitHub: ichiyan ◆ Portfolio: https://ichiyan.github.io/dev-portfolio/

With a solid foundation in full-stack software development, I am well-versed in object-oriented programming, REST APIs, database management, architectural patterns, clean code practices, version control, and more. I am also proficient in data science fundamentals and am keen to building impactful data-driven solutions. Moreover, my strong problem-solving and collaborative skills, coupled with adaptability, keen attention to detail, and commitment to quality and growth, enable me to deliver exceptional results, even in fast-paced environments and with minimal supervision.

## TECHNICAL PROFICIENCIES

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|---|---|
| **Web Development** | HTML, CSS, Sass, JavaScript, TypeScript, SQL, ReactJS, NodeJS, Python, Django, Java, Java Spring Boot, Java Hibernate, PHP, Laravel, MySQL, Dbeaver, DataGrip, Postman |
| **Mobile Development** | Dart, Flutter, Android Studio |
| **Data Science and Analytics** | Python, NumPy, Pandas, Seaborn, Scikit-learn, PyTorch, HuggingFace, BeautifulSoup, Selenium, Google Colab, Paperspace |
| **Other Languages/Technologies** | C, Git, GitHub, Visual Studio Code, IntelliJ IDEA, Docker |

## WORK EXPERIENCE

**Software Engineer Intern** — May 2023 - September 2023
Alliance Software Inc. — *Cebu City, Philippines*

- Worked on the front and back-end development of a web-based supply chain management system and e-commerce system using ReactJS, Java Spring, and MySQL
- Wrote SQL scripts for data fetching, merging, aggregating, and more to create reports
- Streamlined development processes by creating reusable components that could be shared across different parts of the application
- Optimized code performance by identifying bottlenecks and refactoring for improved efficiency

**Software Developer** — October 2021 - March 2022
Trent (subcontract) — *Remote*

- Implemented the front-end screens of a delivery service mobile application using Flutter and Android Studio
- Used the Google Maps API to track delivery riders' location

## EDUCATION

**Bachelor of Science in Computer Science**
University of San Carlos — *Cebu City, Philippines*

- *magna cum laude*
- *cum laude caroli sancti* (with high praise of San Carlos) for exhibiting academic competence and skills (Scientia), noble character (Virtus), and dedication to social transformation (Devotio)

**Elementary to Senior High School (STEM)** — *Toledo City, Philippines*
De La Salle Andres Soriano Memorial College

- Valedictorian with High Honors

## RESEARCH PUBLICATIONS

**Neuro-Vis: Guided Complex Image Reconstruction from Brain Signals Using Multiple Semantic and Perceptual Controls** June 2024

DOI:10.1145/3661725.3661744 Project Showcase ↗

- Led the development of a **novel deep learning model** to reconstruct seen natural images from evoked human brain activity using **Python, PyTorch, NumPy, Scikit-learn, HuggingFace, Diffusers, BLIP, VDVAE**, etc.
- Given brain activity data, the model predicts (1) fine-grained image features that capture low-level details with high semantic fidelity, (2) depth maps and (3) color palettes to incorporate structural and color information in the human visual cortex, and (4) text embeddings to form realistic descriptions of the seen images. These predictions drive a modified diffusion-based **generative model** to reconstruct the seen images.
- Outperformed the state-of-the-art methods in terms of consistency in low-level features while also rivaling them in terms of semantics and also produced state-of-the-art image captioning results
- Presented the results during the 2024 International Conference on Computing, Machine Learning, and Data Science in Singapore and the presentation was awarded as the best among its track

## KEY ACHIEVEMENTS

**Best Presenter, International Conference on Computing, Machine Learning, and Data Science** April 2024
International Computing and Engineering Association (ICEA) *Bugis, Singapore*

- Presented our deep learning research paper on brain decoding entitled "Neuro-Vis: Guided Complex Image Reconstruction from Brain Signals Using Multiple Semantic and Perceptual Controls"

**8th Place, Nationwide Diliman Solutions Challenge** March 2021
Google Developers Student Club UP Diliman Chapter *Remote*

- Ranked 8th out of 250 participants and top 30 teams with our proposal and prototype of a mobile application that instills financial literacy through a simulation visual novel-like game, stock market simulation, information corner, and forum

**Best Capstone Project, STEM Fair** February 2019
De La Salle Andres Soriano Memorial College *Toledo City, Philippines*

- Recognized as the best among 20 teams with our rover-type mine search and rescue robot prototype equipped with a first-person view camera, temperature and gas sensors, and mobile application

**Best Research Project and Best Poster Presentation, Division Research Conference** February 2019
Department of Education, Toledo City Division *Toledo City, Philippines*

- Emerged as the best out of more than 20 participating schools for our quantitative research project on the relationship among multiple intelligences, academic achievement, and 21st-century skills of grade 10 students
- Performed pilot testing, administered four sets of research instruments, and applied statistical tools or techniques such as proportion, weighted mean, and Chi-square

**Research Presenter, De La Salle Philippines Academic and Cultural Fair** January 2019
De La Salle Philippines *Ozamiz City, Philippines*

- Invited to present our quantitative research project on the relationship among multiple intelligences, academic achievement, and 21st-century skills of grade 10 students during the DLSP fair participated by all 16 La Salle schools

## PROJECTS

**HappiBuy: E-Commerce API** [View]
*Python, Django, SQL, MySQL, Redis, Celery, PyTest, Locust, Silk, Docker*

- A REST API for an e-commerce application developed using Django REST framework
- Supports secure authentication and authorization with JSON Web Tokens (JWT), CRUD (create, read, update, delete) operations, searching, sorting, and pagination for managing staff, permissions, customers, collections, products, product tags, product reviews, carts, and orders
- Implemented development and production-ready configuration for simple mail transfer protocol (SMTP), task or job queueing with Celery and Redis, caching with Redis, and serving with Green Unicorn
- Configured for running with Docker and for conducting automated testing using PyTest, performance testing using Locust, and profiling with Silk
- Documented the API using Swagger

**Konbi Shop Microservices** [View]
*Angular, Java, Java Spring Boot, Kafka, Resilience4j, SQL, MySQL, MongoDB, Flyway, Grafana, Docker, Kubernetes*

- An online shop with an Angular front end and a back end that applies the microservices architecture using Java Spring Boot, mainly implementing product, inventory, order, notification, and API gateway services
- Implemented the following: (1) user authentication using Keycloak; (2) inter-service synchronous communication using REST Client; (3) event-driven architecture using Kafka; (4) fault tolerance (circuit breaker, time limiter, retry) using Resilience4j; (5) application observability using Grafana Loki for centralized logging, Grafana Tempo for distributed tracing, and Prometheus for metrics monitoring; (6) API documentation using Swagger; and (7) Kubernetes deployment

**Books API** [View]
*Java, Java Spring Boot, Java Hibernate, MySQL, Docker*

- A REST API to create, retrieve, update, and delete book and author information
- Developed using Java Spring Boot with support for nested objects and pagination
- Implemented unit tests using Mockito and integration tests using MockMvc

**TaskVenator: Gamified Productivity App** [View]
*JavaScript, CSS, Bootstrap, ReactJS, NodeJS, ExpressJS, SQL, PHP, Laravel, MySQL, Redis, Socket.IO*

- A productivity application, mainly a task manager, that incorporates immersive gaming elements to boost productivity
- Includes user authentication, to-do list, avatar customization, shop and inventory, party (or group) formation, party tasks, party chat, and quests/battles whereby completing verified quest tasks helps users defeat monsters, level up, and gain in-game currency and items

**CalFitGym** [View]
*JavaScript, CSS, Bootstrap, SQL, PHP, Laravel, MySQL*

- A proposed online storefront and gym management system for California Fitness Gym
- Features the gym's facilities, services, and products and their available inventory
- Allows gym staff to manage employees, customers, gym members, products, orders, inventory, and services depending on their position
- Provides a comprehensive dashboard that consolidates and displays crucial performance metrics and insights, helping facilitate informed decision-making, budget allocation, and strategy optimization

**Doggo: Canine Trading and Services** [View]
*JavaScript, CSS, Sass, Bootstrap, VueJS, SQL, PHP, Laravel, MySQL*

- A web application for the Philippine Canine Club, Inc. (PCCI)
- Provides a platform to buy/sell/adopt dogs coming from registered PCCI members, to support local moral dog breeders, and to promote and monitor ethical dog breeding among the PCCI members

## PROJECTS

**Numerical Interpolation Calculator** [View]
*JavaScript, CSS, Bootstrap, ReactJS*

- Discusses numerical interpolation and one of the many methods called the Newton-Gregory forward polynomial approach, an interpolation that uses equally spaced points
- Provides a calculator for the Newton-Gregory method which when given equally spaced x values, derives the interpolating polynomial and the corresponding graph

**Collection of Data Science Projects** [View]
*Python, Pandas, Scikit-learn, NumPy, Matplotlib, Seaborn, Jupyter*

- Contains data science projects that extract insights from datasets of malware, movies, test results, history of Nobel Prize winners, crime rates, customer analytics, market trends, insurance claims, and more
- Applied exploratory data analysis, data visualization, data cleaning and preparation for modeling, and machine learning techniques such as hyperparameter tuning, classification, regression, and clustering
- Includes development of a basic artificial neural network from scratch

**Collection of Data Scraping Projects** [View]
*Python, Pandas, Beautiful Soup, Selenium, spaCy, WhisperX*

- Scraped and cleaned data from websites and videos/audio with the latter implementing automatic speech recognition with word-level timestamps and speaker diarization using WhisperX

**Camera Capture and Shape Recognition** [View]
*Python, Java, OpenCV*

- The Python implementation codes from scratch the algorithms used for shape detection and recognition: Gaussian blur, Canny edge detection, Suzuki contour, finding the perimeter, and Ramer-Douglas-Peucker (RDP) algorithm for simplifying the contours and reducing the number of points.
- The Java implementation of this project utilizes OpenCV to capture images using the device's camera and to provide real-time shape recognition.

**CPU Scheduling Algorithms and RSA Encryption Simulation** [View CPU] [View RSA]
*Python*

- Developed a console application that simulates six CPU scheduling algorithms and shows tabular and Gantt chart visualizations of the processes from scratch
- Implemented a console application for encrypting and decrypting messages using the Rivest-Shamir-Adleman (RSA) encryption algorithm consisting of key generation, key distribution, encryption, and decryption

**Chess (player vs. player and player vs. computer)** [View]
*Java, Stockfish Chess Engine*

- A chess desktop application built from scratch—without using existing chess libraries except for the Stockfish chess engine that determines the computer's move for player vs. computer
- Supports all legal chess moves including special moves (en passant, castling, pawn promotion), and employs the 50-move rule for claiming a draw
- Players can also set a time limit per turn, view possible moves, undo their move, save the game, resume or start a new game, and view the list of moves in algebraic notation. When playing against the computer, players can choose a side (black or white) and set the difficulty.