

Yasin Arafat

Automotive Software Engineer — ADAS Simulation, Validation & Vehicle Software

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PROFILE

Automotive software engineer with an M.Sc. in Automotive Software Engineering (TU Chemnitz, 2026, grade 2.0). Master's thesis built a closed-loop Automatic Emergency Braking framework in CARLA — ECU-style Perception, Planning and Actuation components, a dynamic safety envelope handling latency, friction and perception uncertainty, and a custom detection-plus-depth network — evaluated across 7,847 braking episodes. Also hands-on with real-time CAN bus communication between distributed ECUs in a cloud-connected autonomous vehicle project, and with production backend development in secure REST APIs and relational data. Seeking ADAS simulation and validation, scenario-based testing or connected-vehicle software roles in an English-speaking team.

AREAS OF EXPERTISE

- ADAS & AEB Function Development
- CAN Bus & ECU Communication
- Connected Vehicle Backend
- Scenario-Based Testing & Validation
- Perception & Object Detection
- Telemetry, Logging & Analysis
- CARLA Closed-Loop Simulation
- Test Automation (Python)
- Modular Software Architecture

TECHNICAL SKILLS

Languages	Python, C, C++, C#, JavaScript, Java, PHP
ADAS & Simulation	CARLA closed-loop simulation, scenario-based evaluation, ECU-style architecture and message-bus design, dynamic safety envelopes, time-to-collision logic, multi-stage braking policies, PI control, slip-aware ABS augmentation
Perception & ML	PyTorch, CUDA, OpenCV, object detection (MobileNetV4-SSD, YOLOv10, SSD, Faster R-CNN), monocular depth and range estimation, detection-confidence and uncertainty handling
Vehicle & Embedded	CAN bus communication, ECU-to-ECU messaging, real-time control logic, Raspberry Pi, hardware-software integration
Validation	Open-loop and closed-loop benchmarking, ablation studies, telemetry export, structured logging, reproducible experiment pipelines, CSV result analysis
Standards	Working familiarity with ISO 26262, SOTIF and Euro NCAP AEB evaluation concepts
Backend	ASP.NET Core, Node.js, Express.js, Laravel, REST APIs, JWT, refresh tokens, PostgreSQL, MySQL, PL/SQL

EDUCATION

M.Sc. Automotive Software Engineering

Technische Universität Chemnitz, Germany | Completed 04/2026 | Final grade: 2.0 (gut)

B.Sc. Computer Science & Engineering

Daffodil International University, Dhaka, Bangladesh | Completed 01/2018

AUTOMOTIVE & SYSTEMS EXPERIENCE

Master's Thesis — Development and Analysis of Dynamic Brake State Scenarios in a Simulation Environment

Technische Universität Chemnitz, Chair of Computer Engineering | 08/2025 – 01/2026 | Grade 2.0

- Built a closed-loop **Automatic Emergency Braking (AEB)** evaluation framework in the **CARLA** simulator, architected as communicating Perception, Planning and Actuation **ECUs** over a message-bus abstraction, with a deterministic timing model and a safety manager handling degraded behaviour.
- Designed a dynamic safety envelope combining measured control-loop latency, friction coefficient, detection confidence and range uncertainty, driving a multi-stage braking policy with time-to-collision confirmation gating, debouncing and hold/release logic.
- Developed a MobileNetV4-SSD network with a depth-regression head for joint object detection and per-detection ranging; benchmarked against YOLOv10, SSD and Faster R-CNN backends for accuracy against real-time latency.
- Implemented deceleration tracking with a PI brake controller and slip-aware ABS augmentation, plus telemetry export, structured logging and a graphical experiment launcher.
- Evaluated across **7,847 logged braking episodes**: 0.25% collision rate and 25.70% nuisance-stop rate; ablation studies showed envelope parametrisation and range-estimation mode shift nuisance rates by nearly two orders of magnitude.

Research Internship — Real-Time CAN Bus Communication for a Cloud-Connected Autonomous Vehicle

Technische Universität Chemnitz | 10/2023 – 04/2024 |

github.com/ArafatTheGoldenBoy/Raspberry_pi-to-pi-canbus-communication

- Developed real-time **CAN bus** communication between Raspberry Pi nodes acting as ECUs, within a cloud-connected autonomous vehicle project.

- Project architecture: a camera-equipped central Pi streamed sensor data to a cloud service for analysis; returned commands were distributed to actuator ECUs over CAN.
- Implemented and tested the node-to-node CAN messaging layer in Python and C/C++, prioritising real-time responsiveness so the vehicle reacted immediately to detected objects.
- Worked with OpenCV-based vision input, debugging and modular development across four structured task modules.

SOFTWARE ENGINEERING EXPERIENCE

Software Developer — SyemaSoft

syemasoft.com | 11/2025 – Present

- Build and maintain secure user authentication using ASP.NET Core Identity, JWT access tokens and refresh tokens.
- Enforce role-based authorization across Admin, User and Security roles.
- Deliver protected work-item management through MVC pages and REST API endpoints.
- Implement audit logging and expose security activity for monitoring.
- Apply security hardening: HTTPS, HSTS, CSP headers, rate limiting, secure cookies and PQC/TLS runtime checks.

Founder & Developer — Two Point Two IT & Co.

Dhaka, Bangladesh | 10/2018 – 10/2019

- Founded and ran a small web development company delivering full-stack applications for local clients.
- Built frontend, backend and database layers, implementing business logic, CRUD operations and database-driven functionality.
- Handled client requirements directly, from initial scoping through delivery, content updates and ongoing maintenance.
- Provided defect resolution and long-term application support across the client portfolio.

SELECTED PROJECTS

Bright Star Grading System

Full-stack web application

- Web-based grading system enabling schools to manage student results digitally.
- Built frontend-to-backend communication using AJAX and REST APIs.
- Implemented bcrypt password hashing and backend database operations for storing, updating and retrieving result data.

Work-Together Meeting Management System

Relational database design and business logic

- Designed a relational database schema for managing meetings between students and management.
- Implemented core business logic in PL/SQL.
- Created structured data models for users, meetings, schedules and management workflows.

ADDITIONAL

Achievements	3rd Place, IEEE AI Spotlight Hackathon 2025
Languages	English — C1 (fluent) German — B1 (intermediate) Bangla — native