Novi, MI
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Essam E. Bouni | LinkedIn

Essam Bouni

Results-driven Staff Hardware Engineer with 15+ years of experience delivering cost-optimized automotive electronic systems, including zonal ECU architectures and low-voltage power distribution. Proven track record leading end-to-end hardware development from requirements definition through validation and production, with deep expertise in SDV architecture, Ethernet-based networks, and power management systems.

Known for driving system-level optimization, BOM strategy, and cross-functional alignment across global teams. Strong background in zonal ECU design and development, requirements engineering, DFMEA, and vehicle-level integration, enabling scalable, high-performance, and cost-efficient platforms.

CORE COMPETENCIES

- Software Defined Vehicle (SDV) Architecture
- Scalable, Configurable A SIL D Zonal ECU Design
- Low Voltage Power Distribution (12V/48V)
- Automotive Ethernet, CAN, LIN, PSI5, SENT Communication
- eFuse / Solid-State Power Distribution
- Requirements Engineering (CTRS, SOR, DFMEA, FMEA, FTA)
- BOM Strategy & Cost Optimization
- Hardware Design (Schematic, PCB, Simulation, WCA)
- Validation & Verification (DV/PV, EMC, Environmental)
- Supplier Management & Sourcing including CM suppliers.
- Cross-Functional Leadership (HW, SW, Systems, Manufacturing)
- Vehicle Interior & Exterior Lighting Systems Engineering

Experience

Melexis Semiconductor | North America 1/2026 - Present

Senior Manager - OEM Technology Roadmap & Customer Engineering Leadership

- Leading North America OEM engagement and technology roadmap alignment for automotive semiconductors supporting SDV and **zonal architecture**.
- Driving North America strategy for **robotic sensing and actuation technologies**, aligning semiconductor roadmaps with rapidly evolving robotics platforms and system requirements.
- Translate OEM platform needs into product requirements and product roadmap, prioritization, and execution plans across R&D and cross-functional stakeholders.
- Drive executive-level technical discussions with customers, positioning solutions, and de-risking adoption through clear technical narratives.

SCOUT MOTORS Novi, MI 2024 – 1/2026

STAFF Engineer

Technical Leader – **Infotainment ADAS HCP, Zonal ECUs, REEV Engine Control, Satellite Comm Integration.**

- Led end-to-end development of zonal ECU architecture, transitioning from domain-based systems HCP to centralized zonal compute with reduced secondary ECU count, enabling scalable SDV platform integration.
- Defined vehicle-wide I/O strategy, shifting from dedicated signals to configurable/general-purpose I/O, reducing ECU count, system complexity, and overall vehicle cost.
- Owned low-voltage electrical architecture, including DC/DC, battery integration, and zonal power distribution, improving system efficiency, scalability, and robustness.
- Led implementation of solid-state power distribution (eFuse), replacing traditional fusing to enhance diagnostics, protection, and energy management.
- Led zonal ECU packaging design to manage thermal performance with various ECU housing materials, and ECU vehicle packaging locations, to deliver optimized performance with lowest mass, highest power consumption based on worst case vehicle driving scenarios.
- Established and executed BOM strategies, optimizing cost, mass, performance, and platform reuse across multiple vehicle programs.
- Developed family/variant strategies and rollout plans, enabling scalable hardware reuse and reduced development and tooling cost.
- Conducted benchmarking and competitive analysis, incorporating industry learnings and safety/regulatory insights into architecture decisions.
- Led cross-functional technical reviews, aligning hardware, software, systems, vehicle configuration, OTA/diagnostics, and manufacturing teams to ensure seamless integration.
- Supported supplier sourcing, development, and qualification, ensuring designs met technical, cost, and regulatory requirements.
- Drove system-level issue resolution (JIRA), providing technical leadership for complex cross-domain failures and integration challenges.
- Authored and standardized Interface Control Documents (ICD) and best practices, improving consistency across ECUs and subsystem integration.
- Reviewed and approved circuit design, schematics, and PCB layouts, ensuring compliance with performance, EMC, and reliability requirements.
- Led cameras FuSa and cybersecurity compliance efforts.
- Led SoC and microcontroller selection, balancing compute performance, power consumption, cost, and scalability for SDV platforms.
- Defined and optimized zonal ECU environmental and EMC testing for the new zonal architecture.
- Led development and integration of vehicle batter management system (BMS)

GENERAL MOTORS Warren, MI 2016 – 7/2023

Product Manager

Technical Leader - Adaptive Driving Beam Feature Development

Feature Owner - Adaptive Headlamp System and Ground Projection

- Successfully led the development and integration of the Adaptive Driving Beam (ADB) feature into global GM vehicles.
- Successfully led vehicle-level development to meet FMVSS108, CMVSS108, and ECE region requirements.
- Managed FuSa system compliance and cybersecurity requirements to meet ASIL-D standards.
- Developed GM's strategy for the next generation of Adaptive Driving Beam (ADB) exterior lighting.

Remarkable Achievement:

Demonstrated vehicle compliance to FMVSS108 with own developed test tools and methods. Reduced tooling cost by $200K

Autonomous Vehicle – Machine Vision Camera

- Architected and developed HD cameras for Ultra Cruise enabled vehicles.
- Led camera, ISP, SerDes, SoC components definition and sourcing.
- Developed solutions compatible with electric vehicles to reduce power, weight, and cost.
- Managed global suppliers design to meet multi region vehicle’s timing.
- Led cameras FuSa and cybersecurity compliance efforts with supplier and GM cross functional teams to meet ASIL-D system level requirements based on ASIL-B components.
- Led GM strategy for next generation Ultra Cruise machine vision cameras.

Remarkable Accomplishment:

Reduced EV consumed power by 5W and reduced weight/complexity of vehicle harness for various vehicles.

Passive Safety – Restraint System

- Successfully Led Global airbag moule development to meet multi market regulations to launch multi vehicles.
- Successfully Led Global cross functional team to meet global functional requirements.

Remarkable Accomplishment:

Executed field action recall with minimum cost.

FUJITSU TEN Novi, MI 2015 – 2016

Engineering Manager – Infotainment System

- Led and managed a development team responsible for North American OEM infotainment solutions.
- Managed hardware, system validation, and electronic lab teams to meet OEM product timing.

ROBERT BOSCH Farmington Hills, MI 2005 – 2015

Engineering Manager – Passive Safety / Engine Controls

Business Development Leadership:

- Spearheaded technical business development with North American OEMs, resulting in a significant increase in market share.

Team Mentoring and Management:

- Spearheaded the development of multi-OEM restraint systems, overseeing the entire process from acquisition to successful vehicle launch.
- Mentored and managed multidisciplinary technical teams, fostering high-quality and cost-effective ECU design.
- Led and managed diverse teams, including hardware development, calibration, customer support, crash testing, and system validation, achieving seamless collaboration and efficient project execution.
- Successfully led and mentored dev team in designing an ECU that met EMC, DFMEA, PFMEA, and FuSA requirements.
- Ensured compliance with OE (Original Equipment) requirements while optimizing quality and cost-effectiveness.

Quality Assurance Oversight:

- Reviewed and approved WCA, DFMEA, FTA reports, and test plans for all restraint system configurations, ensuring compliance with industry standards and safety protocols.
- Reviewed and approved system testing procedures for all restraint system hardware, software, and calibration variants, ensuring compliance with quality and safety standards.

Software Quality Assurance:

- Reviewed and approved restraint system software test plans, HIL (Hardware-in-the-Loop) test reports, and software test reports, ensuring the highest quality and safety standards are met.

Cost Reduction Leadership:

- Spearheaded cost reduction initiatives resulting in a reduction in Total Cost of Ownership (TCO) for ECUs.

Innovative Leadership:

- Played a key role in shaping Bosch's MEMS sensor roadmap for the next generation of Passive Safety and ADAS (Advanced Driver Assistance Systems) technologies.
- Held responsibility for designing the next-generation airbag architecture for North American OEMs, contributing to advancements in safety systems.

Remarkable Achievement:

Significantly grew Bosch NA passive safety market share by 25%, achieved a cost reduction of approximately $100M by eliminating one MEMS sensor through innovative algorithm solutions.

TRW Farmington Hills, MI 1998 – 2005

Staff Engineer / Passive Safety – Restraint System

Business Development Leadership:

- Spearheaded technical business development with Japanese and NA OEMs, resulting in a significant increase in market share.

Cost Reduction Leadership:

- Spearheaded cost reduction initiatives, significantly increasing profit margins.

Honda and Daimler Airbag ECU Sensor Design:

- Successfully led design activities for Honda airbag ECU sensors, overseeing the entire process from sourcing to production.
- Achieved the lowest restraint system development cost, including components and manufacturing costs, ensuring cost efficiency.
- Oversaw restraint module development activities, including WC (Worst-Case) analysis, and FTA (Fault Tree Analysis).
- Responsible for selecting restraint system ECU components, which included reviewing DFMEA test plans and test results reports to ensure compliance with safety goals.

Major Accomplishment:

Reduced OE airbag ECU cost by 20% and helped increase TRW's market share by 15%.

GENERAL DYNAMICS LAND SYSTEMS Sterling Heights, MI 1994 – 1998

Senior Engineer

- Led the design and development activities for electronic control module M1A2-SEP tanks.
- Led the integration of Auxiliary Power Unit for M1A2 tanks.
- Led the integration of M1A2 battlefield identification systems.

Skills

Leadership | Technical Skills | Creative Thinking | Collaboration | Time Management | Business Development | Problem Solving | Risk Management | Hardware and Software Design | Project Management | Technical Standards | Programming Languages | MATLAB | Schematic Capture | PCB Layout Tools | Arduino | NVIDIA DGX

Education

Master of Engineering, Electrical and Computer Systems Engineering
Wayne State University- Detroit, MI • May 1999

Bachelor of Science in Electrical Engineering
University of Michigan-Dearborn Dearborn, MI • December 1994

Patents

Multiple in-production patents in USA, and Germany. Including:

- Vehicle occupant safety system and method (**US20100324774A1)**
- Occupant protection (**DE102008040043A1)**
- Rollover. Personal protection unit controlling method (**DE102008040043B4)**