

AUTOMOTIVE CAPABILITIES

High-assurance engineering for next-generation vehicles

EMBEDDED SOFTWARE | FUNCTIONAL SAFETY | VEHICLE NETWORKS | VIRTUAL VALIDATION

ENGINEERING CONFIDENCE THROUGHOUT THE VEHICLE LIFECYCLE

Bytecraft supports automotive programs with embedded software, systems engineering, functional safety, vehicle networking, diagnostics, verification and virtual validation. Our approach is strengthened by high-assurance aerospace and railway experience, bringing rigorous traceability, configuration control and verification discipline to vehicle development.

AUTOMOTIVE SOFTWARE ARCHITECTURE

- Layered and ECU software architectures
- Component-based architecture
- Service-oriented architecture
- Hardware abstraction layer
- Interface layer and platform services
- Reusable application frameworks

EMBEDDED VEHICLE SOFTWARE

- ECU software development in C and C++
- AUTOSAR-oriented engineering
- RTE, BSW and ARXML integration
- Digital cockpit and instrument cluster
- BMS software and safety monitoring
- Real-time embedded applications

VEHICLE COMMUNICATION & MIDDLEWARE

- CAN, CAN FD, LIN and FlexRay
- Automotive Ethernet and SOME/IP
- UDS and J1939
- Signal routing and communication stacks
- Shared signal storage and data distribution
- Serialization and protocol abstraction

FUNCTIONAL SAFETY ENGINEERING

- ISO 26262-oriented development
- ASIL support activities
- Safety mechanisms and monitoring
- Fault detection and fault tolerance
- Fail-safe and fail-operational concepts
- Compliance-oriented verification

BYTECRAFT

SOFTWARE, SAFETY & VIRTUAL VALIDATION

Scalable engineering for modern vehicle platforms

ISO 26262

ASPICE

AUTOSAR

CAN FD

SOME/IP

MIL / SIL

HIL

MODEL-BASED DEVELOPMENT

- Model-Based Design
- MATLAB and Simulink
- Embedded Coder
- Automatic code generation
- Model-in-the-Loop
- Software-in-the-Loop
- Algorithm validation

DIAGNOSTICS

- UDS diagnostics
- DTC management
- Diagnostic Event Manager
- Diagnostic Communication Manager
- OBD integration
- Fault memory management
- Vehicle-service interfaces

TEST & VERIFICATION

- CANoe and CANalyzer
- Restbus and ECU simulation
- Network simulation
- Vehicle network testing
- Automated regression testing
- Continuous verification
- Automated result analysis

VIRTUAL ECU & SIMULATION PLATFORMS

- Windows-based Virtual ECU
- Simics-based Virtual ECU concepts
- ECU and communication-network models
- Virtual integration and SIL platforms
- CI/CD-integrated automated validation

VEHICLE CONTROL & PHYSICAL INTERFACES

- Sensor fusion and vehicle dynamics
- Steering, brake, torque and motion control
- CAN/LIN transceivers and Ethernet PHY
- RS-422, RS-485 and UART
- Galvanic isolation

FUTURE PLATFORM & SOLUTION INITIATIVES

Reusable ECU Software Platform | Virtual ECU & SIL Platform | Automotive Communication Gateway | Vehicle Data Acquisition Unit | FPGA Communication Accelerator | Model-Based Control ECU

THE BYTECRAFT DIFFERENCE

CROSS-DOMAIN ASSURANCE ADVANTAGE

Aerospace and railway assurance experience strengthens requirements traceability, structured verification, configuration management, test automation and objective evidence generation for automotive programs.

WE CRAFT TECHNOLOGY. WE ENGINEER DEPENDABLE MOBILITY.