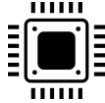


```
// Cache internal data  
data = $.extend({}, {  
  $window: $(window),
```

Software Engineering

FIRMWARE



CLOUD INTEGRATION



DESKTOP TOOLS



MACHINE LEARNING



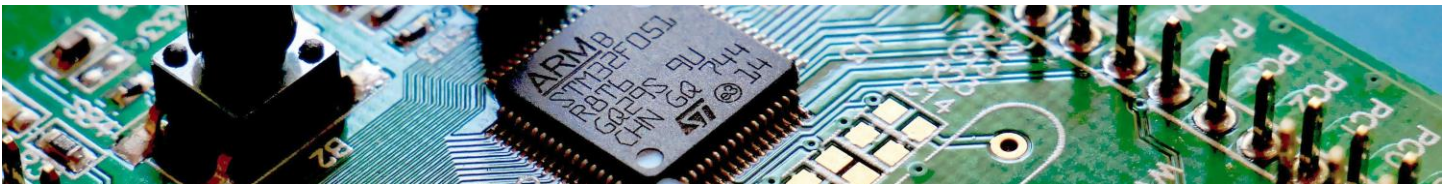
IoT



TESTING



Firmware



BuildEmber develops robust embedded software for devices ranging from simple microcontrollers to complex SoCs. We work with RTOS or bare-metal programming based on project needs, with expertise in platforms like STM32, ESP32, TI Hercules, PIC, nRF, FPGAs, and ASICs.

We specialize in low-level device drivers, simplifying the integration of serial communication interfaces and register configurations. Our firmware maximizes hardware capabilities through efficient power management, communication protocols, and peripheral control. Committed to clean, maintainable code, we ensure scalability and adaptability. Our ability to simulate serial interfaces allows extensive code testing without special hardware.

- ✓ *Manage different peripherals simultaneously.*
- ✓ *Write maintainable sourcecode.*
- ✓ *Deliver documentation.*
- ✓ *Simulate hardware to test logic.*
- ✓ *Integrate CI/CD for artifact control.*

Cloud Integration



We integrate embedded solutions with your preferred cloud platform, utilizing services like AWS for remote monitoring, data analytics, and seamless device communication. Our team is experienced with several cloud-related technologies:

- AWS (S3, Athena, Kinesis, Quicksight)
- Linode
- Docker

We are flexible and can work with any service you choose. By providing infrastructure as code, we ensure your system is reproducible and scalable.

- ✓ *Platform-agnostic integration.*
- ✓ *Connect multiple services to create efficient data pipelines.*
- ✓ *Provide infrastructure as code for system reproducibility.*

Desktop Tools

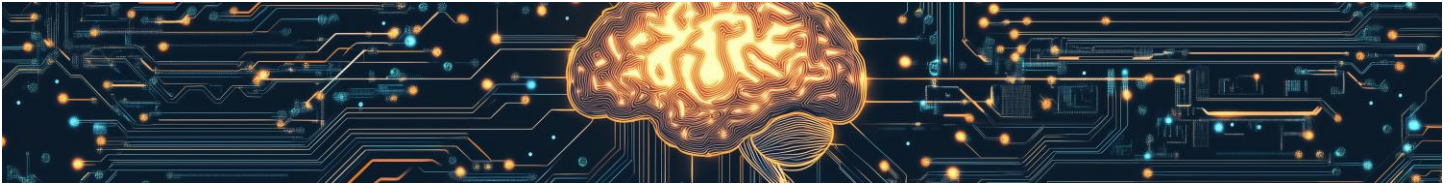


We develop intuitive graphical applications to interface with embedded software, enabling system control and testing. Utilizing Python, we create desktop applications that can integrate multiple data sources simultaneously. Examples of our applications:

- Chemistry Lab CO Absorption Test Application:
 - Graphed data for pressure, temperature, and CO concentration acquired via serial communication and the Phidget22 Python API.
- Provided users with control over mass flow controllers (MFCs), pump motors, and data logging.
- Aerospace Environment Control System Diagnostic Tool:
 - Collected diagnostic data over TCP.
 - Offered features like graphs, logs, status alerts, and motor control.

- ✓ *Interface with our custom hardware and firmware.*
- ✓ *Designed for ease-of-use and versatility.*
- ✓ *Integrate data stream from cloud and embedded sources simultaneously.*

Machine Learning



With professional experience in machine learning for computer vision, we understand that success hinges on carefully trained, realistic data. Proficient in PyTorch and high-performance models like ResNet50, we focus on data acquisition and cleaning to build reliable, end-to-end systems that consistently perform.

- ✓ *Expertise in advanced computer vision models for object detection.*
- ✓ *Emphasis on data quality and consistency*
- ✓ *Integrate machine learning models with cloud and embedded data streams.*

IoT



We enable IoT by integrating sensors, devices, and custom hardware/software over networks. Our expertise spans all IoT layers from hardware integration to cloud connectivity using technologies like Wi-Fi, Bluetooth, and cellular networks for reliable connections.

- ✓ *Integrate diverse devices over networks.*
- ✓ *Provide over-the-air update functionality.*
- ✓ *Ensure secure communication and encryption.*

Testing



Our testing approach leverages Python tools and interface abstraction to efficiently test individual components. By creating modular, reusable test scripts, we isolate and validate parts of the system, accelerating development and reducing integration issues.

We ensure each component works correctly in isolation, enhancing overall reliability when integrated. After assembly, we perform rigorous integration testing, automating as much as possible to cover all scenarios.

- ✓ *Modular design enables independent component testing.*
- ✓ *Test without hardware using interface design and simulation.*
- ✓ *Assess worst-case scenarios for robust performance.*

CONTACT US



Schedule a time to discuss your project needs. Our experienced team members are ready to discuss your project.

Phone



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