Carburetor Automator

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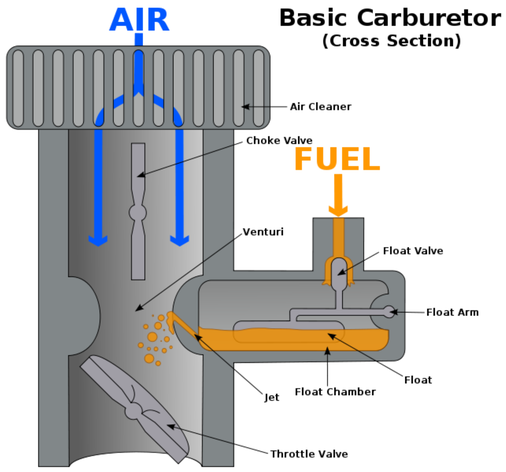
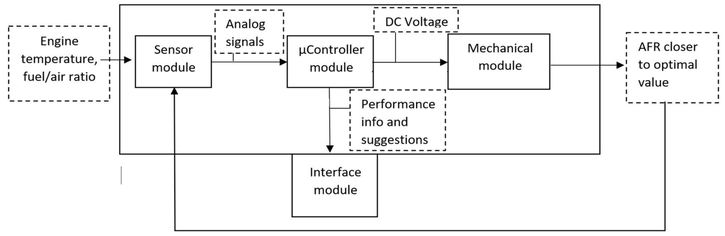
Project

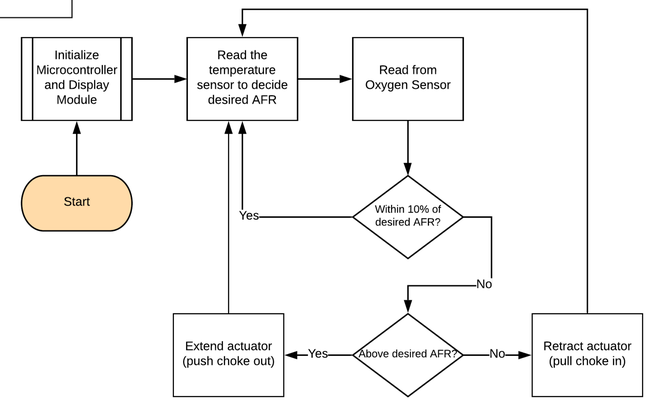
The goal of this project is to improve the air-to-fuel ratio (AFR) delivered in carbureted engines. The AFR affects the power, gas consumption, emissions, and lifetime of an engine. Carburetors use two adjustable flaps and a fixed-diameter, narrow tube to deliver air and fuel to the engine.

Ideally, the proportions of this mixture should be constant, though the absolute amounts should vary. This is not achieved with conventional carburetion. To produce a more ideal AFR, adjustments need to be made to the carburetor dynamically (during engine operation).



System

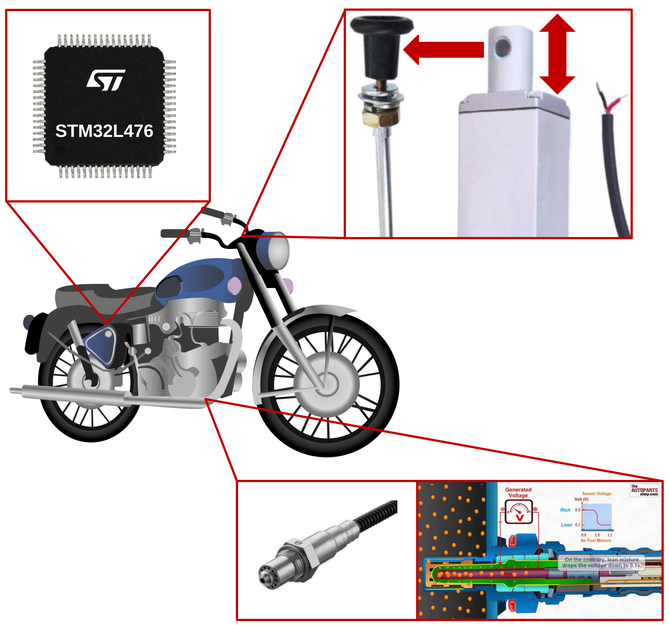




Methods

To improve the performance of the carburetor:

- "Lambda" oxygen sensor installed in the exhaust stream to determine current AFR
- Temperature sensor installed in the oil reservoir to determine desired AFR
- Linear-motion actuator attached to the choke plunger of the carburetor
- Microcontroller reads sensor data and makes adjustments with the actuator
- LCD displays sensor information and safety messages to the user



Conclusion

- The microcontroller code is able to correctly read from the sensors and control the choke actuator
- All data presented through the Display Module is responsive and accurate
- Error detection and stop conditions are functional and effective
- Our system provides a baseline model for using EFI principles to improve carbureted engines

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