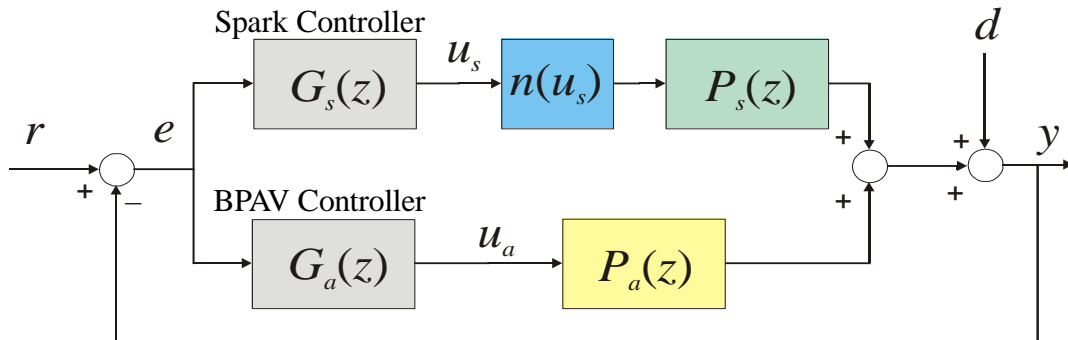


# Multivariable Control-Loop Cooperation

## Research Summary:

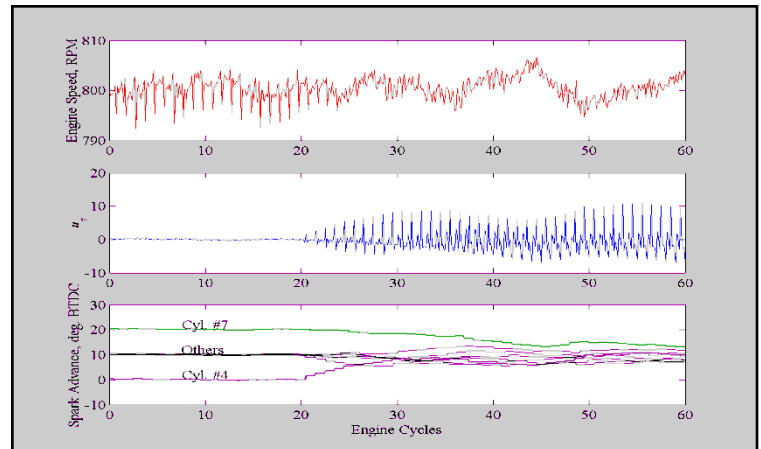
Demonstrated is the use of loop interaction in multivariable systems. **The objective is to exploit multivariable control to achieve multi-objectives in engine transient control, air handling, torque/speed quality and combustion management.** The control solution is systematic where the loop interactions are displayed controller design process can be executed in a desktop environment.

## Controller Architecture



## Results

**Spark Advance** is used to improve engine speed quality and for transient engine speed regulation.



**By-pass air valve** is used to achieve steady state engine speed regulation.

