Open Source, Open Architecture, Scalable, Modular Robotics Family of Projects, in the Vehicle Systems Technology Track of Multi-Disciplinary Senior Design at RIT

**Platform Integration**
- Scalable Modular Common Parts

**Motor Modules**
- 1 kg Payload
- 100 kg Payload
- 10 kg Payload

**DC Motor Control**
- +100° steering angle
- Forward and Reverse
- Encoder Signal Outputs
- Gen 1: RP1 Motor Control
- Gen 2: RP10 Motor Control
- Gen 1: RP1 MM
- Gen 2: RP10 MM
- Downsize RP10 MM
- Re-use Design Content
- Re-use Masks, etc
- Parallel development on a second, drop-in wireless technology as a future option w/ crossbow
- Use the Crossbow XCVR from P08201, Downsize the design

**Wireless Comm's**
- Gen 1: RP1 Motor Control
- Gen 2: RP10 Motor Control
- Mass Produce based on Crossbow technology.
- Parallel development on a second, drop-in wireless technology as a future option w/ crossbow
- SPI Buss Comm’s. CAN BUS Comm’s.
- Incorporate first Generation Open Architecture Wireless System from RIT

**Sensors and Feedback**
- Encoder data recording
- Encoder feedback control, and rudimentary autonomous obstacle avoidance using ultrasonic transducer feedback.
- Fully autonomous maze navigation using dead reckoning against a map reference with obstacle avoidance.

**Software System**
- Develop Linux host machine software library using P08201 as the development target.
- Assume target microproc is the PIC family.
- Autonomous Navigation Alternate Micro-processors as an option to PIC
- Complex Systems of articulated robots
- AY 2006-07
- AY 2007-08
- AY 2008-09
- AY 2009-10
- AY 2010-11

**Gen 1: RP1 Motor Control**
- Mass Production
- Cost Reduction
- Reliability Testing
- Gen 1: RP1 MM
- Mass Production
- Cost Reduction
- Reliability Testing
- Gen 2: RP10 Motor Control
- Mass Production
- Cost Reduction
- Reliability Testing
- Gen 2: RP10 MM w/Suspension

**Gen 2: RP10 Motor Control**
- Mass Production
- Cost Reduction
- Reliability Testing
- Gen 2: RP1 MM
- Mass Production
- Cost Reduction
- Reliability Testing
- Gen 2: RP10 MM w/Suspension

**Gen 2: RP1 MM**
- Mass Production
- Cost Reduction
- Reliability Testing
- Gen 2: RP10 MM w/Suspension

**Gen 2: RP100 Motor Control**
- Mass Production
- Cost Reduction
- Reliability Testing
- Gen 2: RP10 Motor Control
- Mass Production
- Cost Reduction
- Reliability Testing
- Gen 2: RP10 MM w/Suspension

**Motor Modules**
- Direct Drive Wheel
- Forward and Reverse
- Encoder Signal Outputs
- Gen 1: RP1 Motor Control
- Gen 2: RP10 Motor Control
- Gen 1: RP1 MM
- Gen 2: RP10 MM
- Downsize RP10 MM
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