An Esterel Virtual Machine (EVM)
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Why
• Esterel is suited for Deterministic Control Systems
  – Imperative Language
  – Synchronous
  – Concurrency, Preemption
• Not widely available in low cost systems.

Related Work - Pascal
• EVM Concept
  – Compile code for abstract machine.
  – Write Interpreter for each target platform
  – Makes compiler very portable
  – Slower Speed
• Pascal P-Code Machine
  – 1970
  – Machine understood pascal primitive types
  – Single Stack
  – Single Threaded

Related Work - JVM
• Java JVM
  – All java code compiled down to JVM byte codes
  – Stack based – 1 Stack/Thread
  – Supports multiple threads
  – Object creation/de-allocation
  – Monitors for protecting critical code sections

Plan
• Design EVM
• Create Compiler by modifying ECL
• Implement Linux EVM & Test
• Create EVM on Lego Mindstorms
• Compare Approaches
  – Expect EVM approach to be slow
  – Expect EVM code size to be small

Lego Mindstorms
• A Robotics Invention kit
• Brain is a Hitachi H8 Microcontroller
  – 32K External RAM
  – 16K ROM
• 3D Scanner Robot