MQP Interests 2005-2006
by Emmanuel Agu
My Target: 3-4 MQPs for the year

Two areas:
- Graphics on mobile devices
- Location-aware computing
Mobile devices: no GPU, FPU

**Solution:** Software shaders E.g swShader

**Project 1: Compare S/ W to H/ W shader**
- How much power is expended? Tool: PowerSpy
- How much slower?
- Meta effects on full applications. E.g. Quake?

**Project 2: Open Source GLUT for ES**
- New OpenGL ES for mobile devices (subset of OpenGL)
- A few OpenGL ES implementations
- No GLUT for mobile devices
- Implement/port!!
- Already Open source GLUT called freeglut
Project Idea 3: Ray tracer on mobile Device

Thrust: Speed/Power trade-offs in Ray Tracer

- Write/port ray tracer to PDA
- Consider speed-power trade-offs for
  - Varying scene complexity
  - bounding volumes,
  - BSP trees
  - Culling
  - Shading models
  - Texturing
  - Noise functions, etc
- **Previously:**
  - GPS does not work well indoors
  - Developed Locus: Indoor location estimation engine
  - Locus uses radio map, signal strength matching
  - Developed/developing applications (e.g. Visitor tours)
Project 1: Outdoor location estimation
- No outdoor support in Locus yet
- Integrate Locus (indoors) with GPS (outdoors)
- Also explore GPS-less techniques
- New techniques use city-wide signal strength databases. E.g. [www.wigle.net](http://www.wigle.net)

Project 2: ATC laptop tracking using Locus
- ATC currently loans out laptops
- Develop user tracking application on WPI using Locus
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- MQP interests page: http://www.cs.wpi.edu/~emmanuel/research/projects/MQPs.html