Project Ideas
Project Ideas From Many Domains

- Gaming engines
- Media applications
- Algorithms for molecular dynamics
- Protein folding challenge problems
Project Ideas

- New feature rich games or applications
  - Exploit available resources for new effects or features
  - Multimedia feature extraction and indexing

- Simulation of molecular dynamics
  - For drug discovery, protein folding

- Security applications
  - Feature detection (face recognition), pattern matching (network intrusion detection, gene discovery)

- Monte Carlo simulations
  - Medical imaging to recognize abnormal tissues
  - Oil field analysis to find oil rich wells
  - Models for financial markets to maximize profits

- Algorithms that exploit SIMD properties of SPEs
More Project Ideas

- Black-Scholes PDE solver
- Chess
- Face and voice recognition
- JPEG or MPEG encoding
- Linear algebra libraries
- Multi-pattern string matching
- Neural network simulation
- Viterbi algorithm applied to bioinformatics
Examples of Project Scope

- Can take existing algorithms and re-implement them in a parallel or SIMD equivalent
  - Pattern matching for security applications

- Can take existing applications and modify them for the PS3 adding new capabilities
  - Add new features to the Quake 3 game engine

- Design and implement a new project from scratch that harnesses the power of the Cell and PS3
Project Support

- Direct access to PS3 hardware
- Direct access to Tools from Sony and IBM
  - Compilers, tutorials, example codes
- Projects can be implemented in
  - C using threads and Cell intrinsic instructions for direct access to the bare metal
  - StreamIt and StreamIt virtual machine which hides the bare metal and provides a rich programming interface
  - Other approaches are also possible (e.g., OpenMP or MPI)