**Computer Science Topics Names \_\_\_\_Trevor Huang and Matt Schaub\_\_\_**

**Project Proposal** (April 16, 2013)

**Topic: Programming a game with PyGame**

**Objective: Program a game with music, sound effects, animation, and AI**

**PART I: Research** (April 26, 2013)

1. **List and describe in detail the new topics/content that will be learned.**
2. **Learn how to use PyGame to understand collision detection and input**
3. **Learn how to create a person that will do different animations depending on user input**
4. **Learn how to import pictures, sound, etc. and how to rotate, animate and detect collisions with imported pictures**
5. **Learn how to program AI to follow A star algorithm and make different AI methods from this algorithm**
6. **List a minimum of three resources.**

* <http://www.policyalmanac.org/games/aStarTutorial.htm> -- This website provides possible implementations of this kind of pathfinding algorithm and how it works
* <http://rene.f0o.com/mywiki/PythonGameProgramming> -- this will give some essentials to PyGame such as the clock ticking, input, and drawing
* <http://eli.thegreenplace.net/category/programming/python/pygame-tutorial/> -- this gives details on tiling and good example code on how he made “creeps” move around walls
* <http://www.pygame.org/docs/> -- contains all the functions of PyGame
* <http://scriptogr.am/jdp/post/pathfinding-with-python-graphs-and-a-star> -- In depth description of pathfinding and A star with python
* <http://www.pygame.org/project-AStar-195-.html> -- Implementation of A star in PyGame
* <http://sci-fair.cpcug.org/1999/Preygel/Preygel.html> -- Details other algorithms for pathfinding and gives some analysis of their efficiencies.

**PART II: Project**

Trevor and Matt will learn in depth how to create a game where a character navigates through labyrinth like levels to collect treasure before needing to escape while evading AI (that cannot turn around) with different methods that use the A star algorithm. The game will be controlled by arrow keys and a key to dig through certain walls. The player will see the game from a bird’s eye view and the game will be four levels.

**PART III: Project Checks**

1. **Goals completed by Project Check #1:** (May 10, 2013)

* **Implement 2D array of size 15 by 15 and every cell will contain a value for every type of object (walls, person, enemies, etc.)**
* **Implement a superclass called game\_objects that will contain a constructor with a position, a speed, and a direction**

1. **Goals completed by Project Check #2:** (May 17, 2013)

* **Obtain graphics for walls, gold, character, and enemy and make it so character can move to different squares in the 2D array with arrow key input**
* **Make classes for everything except enemy AI and repairing walls**

1. **Goals completed by Project Check #3:** (May 24, 2013)

* **Implement enemy AI to be able to follow the character**
* **Finish repairing walls**

1. **Goals completed by Project Check #4:** (May 30, 2013 for Non-Seniors)

* **Add animation to character moving and AI moving**
* **AI can patrol an area or wait for character to move into line of sight**

1. **Goals completed at end of project.** (Scheduled Final Exam Day)

* **Game completed with music, sound effects, and 4 levels**

**PART IV: Project Approval**

Student’s Signature 1 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Teacher’s Signature \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date Student’s Signature 2 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_