Developing a MOOCS Platform for Online Personalized Learning allowing Sketch Input

**PI: Tracy Hammond,**
Director, Sketch Recognition Lab,
Associate Professor, Department of Computer Science & Engineering,
Dwight Look College of Engineering

**Graduate Advisor: Stephanie Valentine,**
Research Assistant, Sketch Recognition Lab,
PhD Student, Department of Computer Science & Engineering,
Dwight Look College of Engineering

**Participating Students:**
Andrew Erich Carlberg, Computer Science
Amanda Nicole Cofsky, Computer Science
Stephen Michael Dawkins, Computer Science
Kaitlin Myhre Farr, Computer Science
Avid Cyrus Ghamsari, Computer Science
Jared Daniel Gotte, Computer Science
Daniel Anthony Ibanez, Computer Science
Kimberly Ann Lewis, Computer Science
Thomas Ray Lewis, Industrial Engineering
Matthew Thomas McFadden, Computer Science
Margaret Louise O’Brien, Computer Science
Blake Aron Pavel, Computer Science
Joshua Adrian Robles, Chemical Engineering
David Joseph Spellman, Computer Science
Daniel Timothy Santos Tan, Petroleum Engineering & Computer Science
David James Turner, Computer Engineering

**Grand Challenge to be Addressed:**
Advance Personalized Learning

**Motivation:** Massive online courses (MOOCS), such as those offered by Coursera, are gaining popularity. Schools such as Stanford University and the University of Washington are offering free online courses with unlimited capacity, and regularly have over 100,000 students register and participate in a single course. While these courses have massive impact, their ability for personalized learning is limited. Automatically graded questions are currently limited to multiple-choice options. Grading other types of problems that require hand-drawn input currently require human input, and usually must be eliminated from the course curriculum in these mass classes. Some classes have developed creative grading strategies such as peer grading or crowd-sourced solutions, but these solutions are limited and filled with uncertainty.
**Texas A&M Advantage:** Texas A&M University has a large, well-known sketch recognition laboratory. We have substantial capabilities for developing effective solutions for automatically correcting hand-drawn homework solutions. As almost all subject domains consist of some sort of sketched diagram (graphs in economics, chemistry solutions, etc.), the potential for having a system that can automatically correct such diagrams across a wide number of MOOCS domains is substantial. Additionally, being first to provide such a service is invaluable, and as such it is worth putting a significant amount of resources to the problem quickly.

**Objective:** The objective of the project is to develop a platform that can be used across several courses, enabling instructors to draw their ‘key’ solutions, and have their students’ solutions compared with the key. Secondly, we will establish both high- and low-level feedback to give the students incrementally based on their drawings. To ensure that the platform is flexible across domains, it will be initially tested and made to work with Japanese language learning, chemistry diagrams, and statics diagrams.