

NATIONAL UNIVERSITY OF SINGAPORE

School of Computing

C S S E M I N A R

Title: **Automatic Instructional Scaffolding through Cognitive Modeling**

Speaker: Assistant Professor Erik Andersen
 Department of Computer Science
 Cornell University

Date/Time: 29 March 2016, Tuesday, 10:30 AM to 11:30 AM

Venue: MR1, COM1-03-19

Chaired by: Dr Kan Min Yen, Associate Professor, School of Computing
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Abstract:

A key challenge in education is designing engaging instructional content that can be tailored to the needs of each student. I argue that we can do this by constructing cognitive models of the knowledge we want to teach, analyzing these models to generate learning materials automatically, and optimizing these materials through large-scale experimentation. I will present a framework for automatic analysis and synthesis of educational progressions, which we have applied to topics as diverse as mathematics, phonology, and sentence understanding. I will show how we can deploy and evaluate this framework through video games with thousands of players, including our math puzzle game Refraction, our Thai alphabet game Bpan Yaa, and our 3D language immersion game Crystallize. I will also present an automatic grading system that can reverse-engineer students' incorrect thought processes to diagnose systematic misconceptions in math.

Biodata:

Erik Andersen is an assistant professor in Computer Science at Cornell University. He received his Ph.D. from the University of Washington and was once an exchange student at NUS. His research aims to make education more engaging, automated, and adaptive. He is a co-creator of multiple educational video games that have attracted millions of players and received major awards from Disney and NHK. His work has received three best paper nominations and a best student paper award at CHI, EDM, and AIIDE.