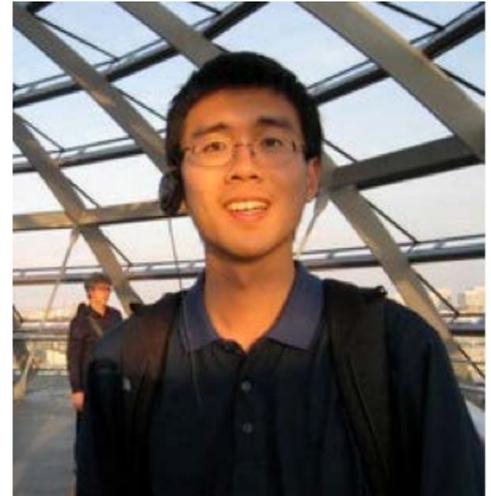


### **Assigning a Small Agreeable Set of Indivisible Items to Multiple Agents**

**Warut Suksompong**  
**Computer Science**  
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**Date:** 13 Dec 2017 (Wednesday)  
**Time:** 3.00pm – 4.00pm  
**Venue:** Colloquium Seminar Room 2  
SPMS-MAS-05-35  
School of Physical and Mathematical Sciences

#### **Abstract**

We study the problem of assigning a small subset of indivisible items to a group of agents so that the subset is agreeable to all agents, meaning that all agents value the subset as least as much as its complement. For an arbitrary number of agents and items, we derive a tight worst-case bound on the number of items that may need to be included in such a subset. We then present polynomial-time algorithms that find an agreeable subset whose size matches the worst-case bound when there are two or three agents. Furthermore, we investigate the problem of efficiently computing an agreeable subset whose size approximates the size of the smallest agreeable subset for any given instance. We consider three well-known models for representing the preferences of the agents---ordinal preferences on single items, the value oracle model, and additive utilities---and establish tight bounds on the approximation ratio that can be obtained by algorithms running in polynomial time in each of these models.

#### **Speaker Biography**

Warut Suksompong is a PhD student in computer science at Stanford University, where his advisor is Tim Roughgarden. His research interests include algorithmic game theory, mechanism design, social choice theory, and other problems at the interface between computer science and economics. Before coming to Stanford, he received his bachelor's and master's degrees from MIT. He is a recipient of a Stanford Graduate Fellowship and a Siebel Scholarship.

**Host: Dr Bei Xiaohui**

**Division of Mathematical Sciences, School of Physical and Mathematical Sciences**