

Job talk for CAISS/ Computer Science

## "Infusing Usability Into Security Through Natural Language"

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**Abstract:** Passwords are still the first line of defense in many computer systems, hence they have a critical place among the security vulnerabilities that involve human aspects. In this talk, I will present a scheme that reconciles the apparent contradictory requirements from most password policies: That the password should be random, and that it should be memorized and never written down. The scheme is applicable to any existing text-based password authentication service and requires neither any modification to the infrastructure, nor any out of band computing device at hand (not even a calculator). Our approach consists of generating a mnemonic sentence that helps the users remember a multiplicity of truly random passwords, which are independently selected. I will also describe an improvement on this authentication system using a technique called combinatorial group testing, which was proposed during World War II for testing blood samples. The improved system provides mutual authentication even in "input constrained environments", e.g. users with motor disabilities, small electronic devices, or non-private environments.

I will also give a glimpse of my current and future work in other information security topics including text watermarking and defense against phishing.

This talk is intended for a general audience, computer scientists and anyone working in Information Security and Natural Language Processing.

**Bio:** Umut Topkara has received his PhD from the Computer Science Department of Purdue University in August 2007. His research interests lie at the confluence of Information Security, Natural Language Processing and Computer-Human Interaction, specifically their intersection in the field of Usable Security. More recently, he has been post-doctoral researcher at Carnegie Mellon University and worked on machine learning solutions to phishing. He got his B.Sc. and M.Sc. degrees from Computer Engineering Department of Bilkent University. More information about Dr. Topkara's research is available at <http://umut.topkara.org>