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Fist of the 21st Century Sender

**** GE-104, 1500-1600, 16 April 2018 ****

Abstract: During the Second World War, telegraph operators were identified by their “fist”, or unique pattern of on-off tones resulting from individual characteristics of the sender. Today, with vastly increased sensing capabilities, human and device behavior emanate throughout both military and civilian communications. Temporal behavior is especially pervasive; under the assumption of strong encryption, the time a message transmits is generally public-facing, and in aggregate form, timestamps can reveal both the message contents and the identity of the sender. In this talk, I will discuss the security and privacy implications of emanating behavior and elaborate on the main principles that underlie the above phenomena. I will focus on two applications that leverage keystroke timestamps: text recovery, exploiting consistencies in user typing behavior, and host identification, exploiting device-level differences in the way I/O interrupts are handled. Finally, I will describe the quantitative security/usability tradeoff that must be addressed in order to mitigate these threats.

Biography: John “Vinnie” Monaco is a Computer Scientist at the U.S. Army Research Laboratory and Adjunct Professor at Pace University. His research focuses on the statistical modeling of user and device behavior, security and privacy in human-computer interaction, and leveraging neural-inspired architectures to solve computationally-hard problems. He earned his Ph.D. in CS from Pace University in 2015. During that time, he was named one of Westchester's “Top Professionals Under 30”, achieved 1st place in several international biometric competitions, and recently won Best Paper Award at the 50th IEEE ISCAS.