Exploiting user chronicity over Online Social Networks

Kostas Nikoloulis, Vasilis Stavrou, Miltiadis Kandias

(k.nikoloulis, stavrou, kandiasm)@aueb.gr

Information Security and Critical Infrastructure Protection Research Laboratory
Dept. of Informatics, Athens University of Economics & Business (AUEB)

Introduction

- Insider threat: Major issue in cyber and corporate security
- Rapid explosion of participation and increase of user generated content in OSN
- Users transfer their offline behavior to the online world
- Open Source INTElligence (OSINT) in the service of profiling and data processing
- Exploitation of user chronicity to detect deviations in the digital world
- Deviations may be related to experiencing increased stress levels

User chronicity

- Chronicity refers to the usage deviations that users may exhibit within the context of OSN over time
- Detect usage pattern fluctuations of users’ OSN generated content
- Split users’ usage patterns into weekly time periods
- Form clusters based on the usage patterns manifested in user’s digital life
- Clusters with the least populations indicate potential usage deviations

Methodology:

- Examine user’s content in order to detect deviations over user’s usage behavior
- Classify content into predefined categories of interest
- Analyze usage behavior based on chronicity metrics
- Form clusters of similar usage behavior and detect the deviating ones

Content classification:

- Train classifier to detect content belonging to: (a) sports, (b) music, (c) politics, and (d) miscellaneous.

User chronicity analysis:

- Usage chronicity is calculated via a set of ad hoc metrics.
- Analysis is focused on the following areas: (a) user interests, (b) usage patterns over time, (c) multi-media usage and (d) aggressive language.

Chronicity classification:

- SVM classifier

References