CYBECO

Supporting Cyberinsurance from a Behavioural Choice Perspective

The CYBECO project aims at developing new tools for cybersecurity risk analysis that will help organisations in the selection of security measures against cyber attacks and insurance suppliers in the design of cyber insurance schemes, complementing such security measures.

CYBECO kickoff meeting

It is a collaborative research project among the following European organisations:

- TREK Development S.A. (Greece, coordinator)
- Instituto de Ciencias Matemáticas (CSIC-UAM-UC3M-UCM, Spain)
- Intrasoft International S.A. (Luxembourg)
- Devstat Servicios de Consultoría Estadística S.L. (Spain)
- AXA Technology Services (France)
- Technische Universiteit Delft (Netherlands)
- Northumbria University, Newcastle (United Kingdom)

CYBECO started May 1st 2017 and will continue until April 30th 2019.

Key ideas about cybersecurity risks

Cybersecurity has become a critical issue for businesses, institutions and public administrations. Cybersecurity involves economic, social, technological and innovation challenges. However, it has not been a key priority in IT development until relatively recently. The fast evolution of an increasingly connected society sets the pace for cybersecurity developments. The Internet is present in more and more aspects of our lives and new cybersecurity risks emerge every day, threatening our relations, finances, health and environment. Some key issues are:

- Cyber attacks against critical infrastructures and major organisations – like nuclear plants, power grids, banks and telecommunication networks – are growing exponentially.

- The pervasive digitalisation of business and physical assets implies that cyber incidents could lead to consequences not only in the compromise of valuable information, but also in the disruption of industrial operations or critical infrastructures like hospitals, power grids or airports.

- An effective risk management strategy could rely on insurance policies that fulfil a double role by reducing losses in case of incidents and by providing incentives to improve security. However, cyber insurance is still a relatively new service that has not yet taken off.

- Models for risk analysis and adversarial risk analysis, if properly tuned, can be used to anticipate attacks and their consequences in the virtual and physical worlds.

The CYBECO proposal

The CYBECO project will study the coordinated effect of insurance and security measures in cybersecurity risk management. This provides valuable information for supporting the development of new insurance schemes that encourage the implementation of more effective security measures.

Challenges

- Overcome cybersecurity gaps by developing new technical and societal, institutional and economic approaches.

- Harmonise institutional (national & international) and incentive frameworks (financial, regulatory) for cybersecurity.

Scope

- A multidisciplinary approach including economics, mathematics, engineering, and behavioural and social sciences.

- Design of improvements/alternatives to current institutional and governance frameworks.

Results

The CYBECO framework will consist of models, a tool and policy recommendations aimed at facilitating better-informed security investments, and based on modelling and combining the choices made by cyber attackers, by cyber insurance providers and by the owners of digital systems. Specifically, CYBECO will:

❶ Develop mathematical models for adversarial risk analysis in cybersecurity that anticipate the behaviour of cyber attackers and estimate the damage they can cause.

❷ Conduct behavioural and economic experiments to improve insurance decisions of digital system owners.

❸ Identify possible gaps in directives, cybersecurity standards and cyber insurance services that are not optimal for fostering a thriving cyber insurance ecosystem.

❹ Develop a software toolbox for applying the CYBECO framework.

❺ Validate the CYBECO framework in cyber insurance case studies.

Impact

•Improved societal understanding of, and solutions to, cybersecurity failures.

•Improved risk-based information security investments.

•Increased societal resilience to cybersecurity risks.

•Advances in cybersecurity economics models.

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Horizon 2020 is the current macro program of the European Union for funding research and innovation activities. This plan aims to provide answers to seven challenges of the European society that have been identified as a priority. Among them, the digital security area and, more specifically, the economics of cybersecurity topic.

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Horizon 2020 Research and Innovation Program

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