Wageningen University & Research

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Introduction: Wageningen University & Research

Background & core activity/activities of the organisation.

- University and specialized research institutes
- Lifesciences – *markets (long tradition in futures and option markets)*

Size and location(s) of your organisation.

- Over 7000 employees; over 370 professors
- Based in Wageningen (the Netherlands); research projects all over the world

Department(s) that will be involved in the project.

- Marketing Consumer Behavior Group
- Information Technology Group
- Wageningen Economic Research

(1 min)

Connections to the Call

Why/how is this Call relevant/important to your organisation?

- Futures markets serve critical risk management purposes society
  - Functioning of these markets are threatened by market manipulation
- Domain: commodity and energy markets
  - Illegal practices cause uncertainty, volatility and distrust in energy/commodity markets

In sum: the functioning of critical market infrastructures are endangered by illegal market behavior

How do you see your role in the project? / Past activities or experiences with the Call topic?

- Leading two working packages
- Project HighLO: technical reference and template for each use case

(2 min)

High Energy Physics Tools in *L*imit *O*rder Book Analysis

www.highlo.org

- **Challenge:**
  Effectively combatting manipulation in financial/energy/commodity markets

- **Goal:**
  Interdisciplinary develop new methodologies to **detect/identify** manipulation and

- **Reduce** the vulnerabilities of critical market infrastructures

Key team	Affiliated Researchers

Key Findings

- We can now …

  - **process, visualize and analyze** terabytes of market data

  - **visualize, characterize** and **identify** market manipulation

  - **statistically** test microsecond changes in markets

  - **simulate** (financial) markets

- **International Expert Group on Market Surveillance:**

Exchanges

Regulators

5

Specific interest & expertise

What are your direct interest areas in the SHIELD project?

- Protecting commodity, Financial and Energy markets (organized exchanges- regulators) from disruption / market manipulation

What technical expertise do you have within the organisation to address the challenges in the Call and in the SHIELD description?

- Anomaly detection, agent-based simulation, big data

- HighIO

- International Expert Group on Market Surveillance

Could you also briefly describe the data analytics team you have in your organisation?

- Long tradition in modelling of data using various approaches (multivariate, econometrics, biometrics, ML etc.)

(1 min)

Envisioned use of SHIELD project results

Could you characterize the data (kind, frequency, bandwidth) you have, and what you do with that data?

- Two datasets of the largest futures exchange in the world (CME Group); all markets; timestamped at milli- and nano-seconds; 2015 and Jun2019 – Jul2020; 30TB and 300TB.

- Receiving energy market data

Could you briefly give a few examples of potential attack vectors that have a data footprint?

- Market manipulation, insider trading, money laundering

Where/how could the project results be embedded in your organisation ? (*organisational, hierarchical*)

- This project would easily be embedded in the current structure that we already have for HighIO

What would be your envisioned integration path for the project outcomes inside your production system?

- Already done

(4 min)

Project outcomes

What would be the optimal outcome of the project for your organisation?

- Functioning agent-based simulation for (financial and energy) markets

- Detection tool for select types of market manipulation SUBSEQUENTLY develop tools (technical as well as market structure and legal) to prevent market manipulation

--> interestingly we do have already a prototype dashboard that provides the necessarily information for market manipulation detection, the subsequent step by means of Shield would be to also focus on protection.

To which network(s)/audiences do you have access to present project outcomes?

- International Expert Group on Market Surveillance
  - Includes financial, commodity and energy market stakeholders that need the outcomes of SHIELD

(1 min)