

NAIADES

Webinar Series

Is this the future of water?



JUNE 23, 2022
11.00-12.30 CET



DUBLIN

Join Us!

aimen
TECHNOLOGY CENTRE

**Jožef
Stefan
Institute**

UDG
Alliance

MANDAT
INTERNATIONAL 

guardtime 

Chair



Webinar Series

Moderation by:



Anna Bréline
Mandat International

Agenda

- **Water data interoperability** Eunah Kim, *UDG Alliance*
- **Smart AI services – architecture of smart water management ecosystem** Juan Fernández Montenegro, *AIMEN*
- **Anomaly detection services in water management** Alenka Guček, *Jožef Stefan Institute*
- **Long-term data integrity** Tuuli Lõhmus, *Guardtime*
- **Wrap-up and Discussion**

Speakers



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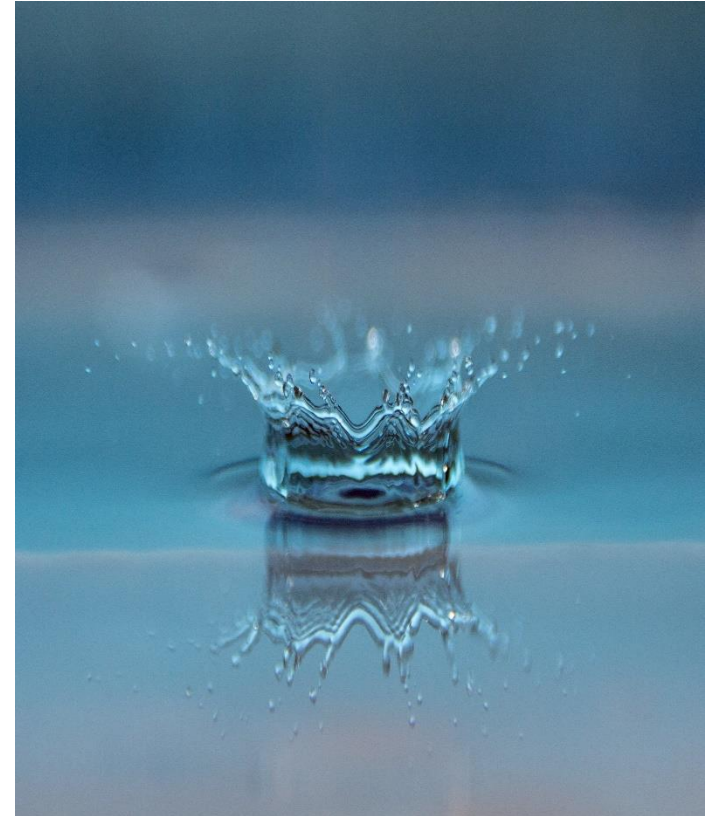


Eunah Kim
UDG Alliance

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Water data interoperability

Eunah Kim, UDG Alliance





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Speakers



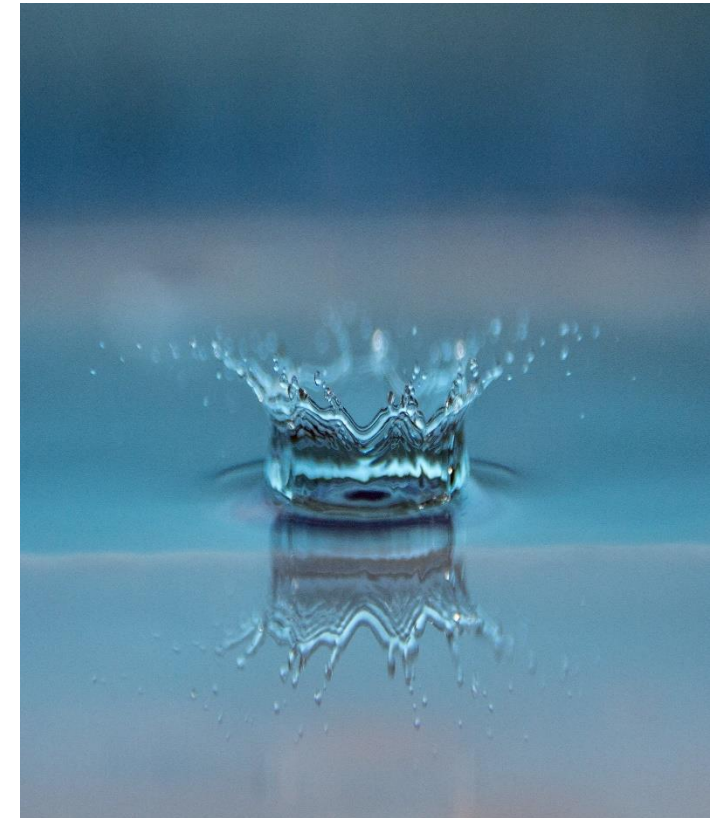
Juan Fernández Montenegro

AIMEN

A vertical strip on the left side of the slide showing a close-up of vibrant green grass blades, slightly out of focus to create a sense of depth.

Smart AI services - architecture of smart water management ecosystem

Juan Fernández Montenegro, AIMEN





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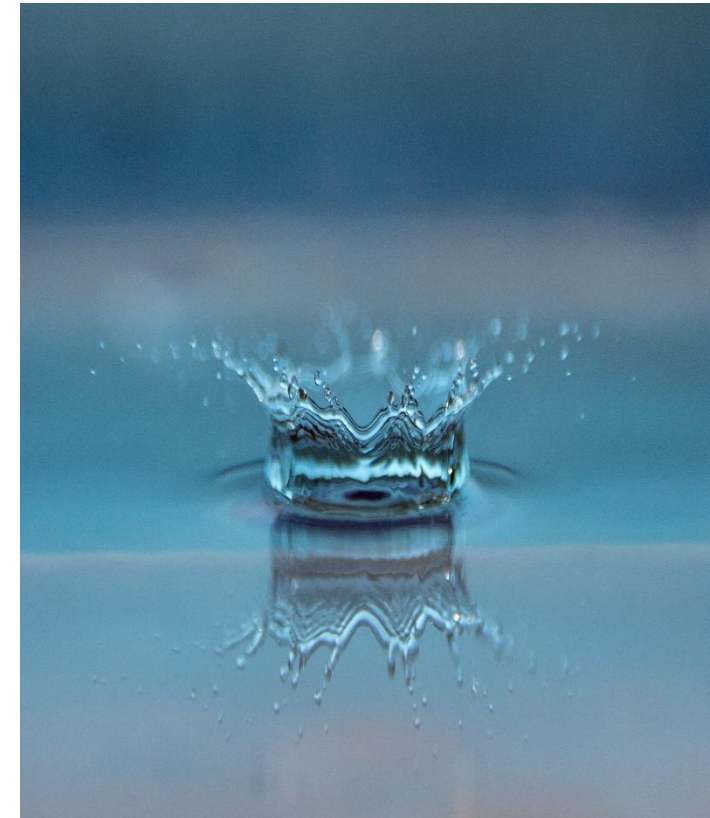


Alenka Guček
Jožef Stefan Institute

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Anomaly detection services in water management

Alenka Guček, Jožef Stefan Institute





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Speakers



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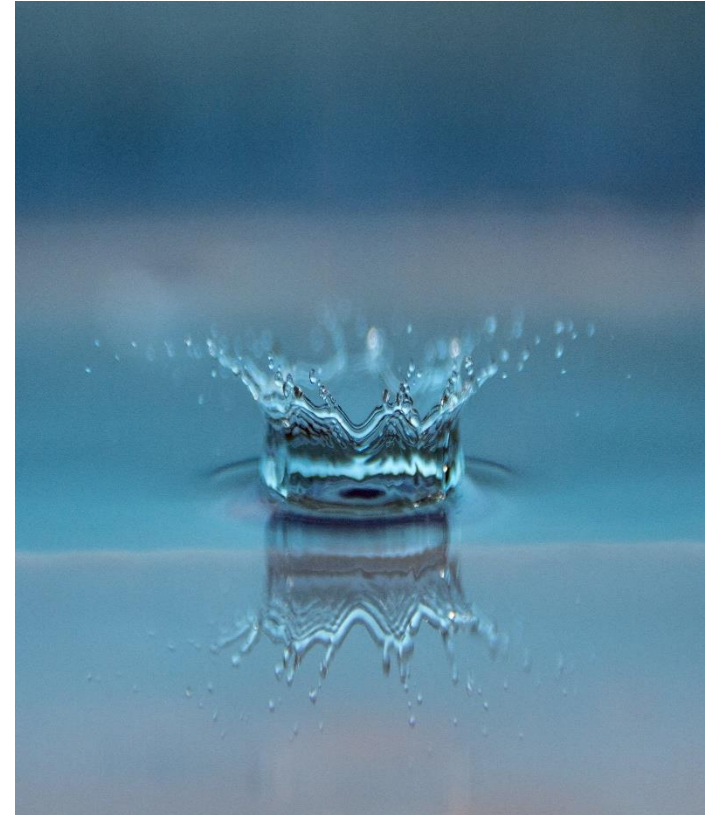


Tuuli Lõhmus
Guardtime

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Data integrity

Tuuli Lõhmus, Guardtime



Plan for the talk

- What is integrity?
- Why check data integrity before using the data?
- Data integrity validation in NAI ADES
- Future of data integrity

Why check data integrity before using it?

- In general, a lot of **predictions, planning and decisions are based on data.**
- If data has been modified maliciously or accidentally during the transport or storing process, the **analysis will be faulty.**
- Data integrity validation ensures that the **data is unmodified and can be trusted.**
 - This includes being able to check the integrity in the **long term** without knowing any secret passwords.
- **Integrity checking does not help if the data source (e.g. sensor) is producing faulty output.**

Integrity validation in NAIADES



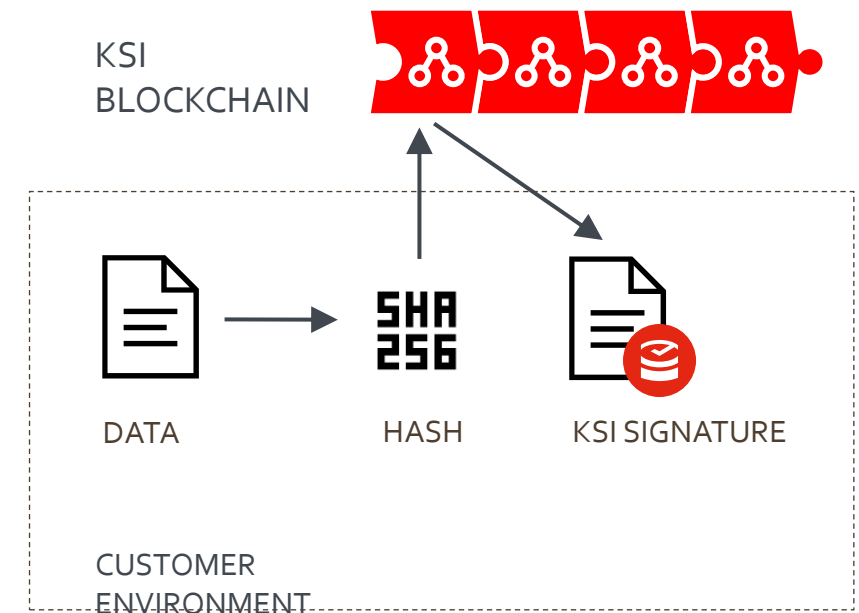
- NAIADES project uses a lot of data as an input for models and predictions (weather, water demand, water quality).
- Data integrity checking is one of the steps to ensure good quality input.
- Data integrity for all the data sent to NAIADES platform can be verified.

Integrity validation in NAIADES



ONE-WAY ONLY.
REVERSING **IMPOSSIBLE**

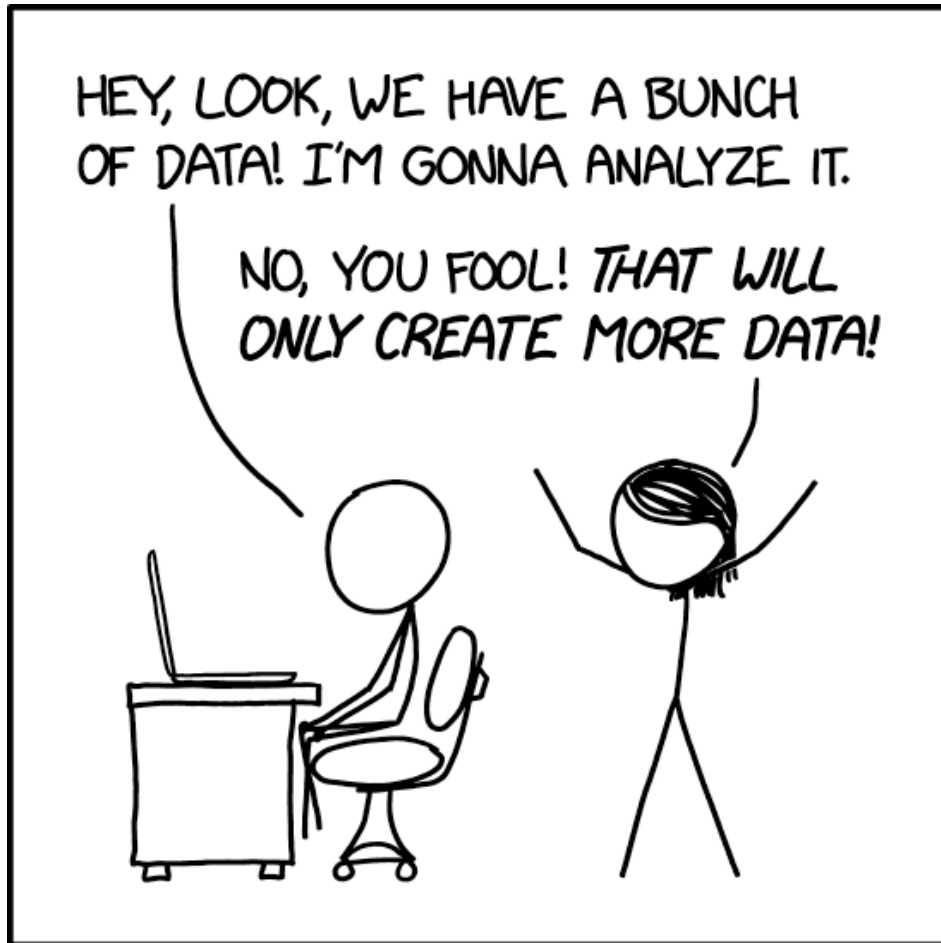
- Cryptographic hash is a one-way function that where a significant change corresponds to a small change in data
- Data hashes are linked to KSI Blockchain
- Benefits of using KSI signatures
 - Signatures **independently verifiable**
 - Do not expire, **long-term forensic proof**
 - **Overcomes technical limitation** of other blockchain technologies



Integrity validation in NAIADES

1. Data is signed at the data source.
2. Signed JSON is sent to Data Model Validator (DMV) where the model is at first validated.
3. DMV forwards the signed JSON to KSI verifier for integrity verification.
4. **For all data, data model and KSI signature are both checked.**
5. Any issues for integrity checking are reported to the user of NAIADES platform.

Future of data integrity



Credit: xkcd (<https://xkcd.com/2582/>)

- Importance of data is increasing, including for AI
- Critical infrastructure operations
 - Water
 - Energy
 - Finances
 - Health

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A vertical strip on the left side of the slide shows a close-up of vibrant green grass blades.

Panel discussion & Wrap-up

A vertical strip on the right side of the slide shows a high-speed photograph of a water splash on a reflective surface, with the splash and its reflection clearly visible.

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