



# CELTIC AI Proposers Webinar

31<sup>st</sup> March 2020, 14:00 – 17:00 CET



Pitch of the Project Proposal

## Artificial Intelligence for Mine Waters (AI4MW)



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# Management of enrichment processes and water balances of mines by AI and on-line measurements



- 1. The **on-line measurements** in various locations and phases enable monitoring of both enrichment process and water quality and thus enable **immediate actions**.
- 2. The **adaptation and control** of enrichment processes (for each mine) will be optimised and **boosted** with Machine learning and Artificial Intelligence.
- 3. Enrichment process will become more **environmental friendly** as the amount of **chemicals** can be **adjusted and controlled on-line**.
- 4. The **water balance** of mines is managed and less natural water is needed as part of it can be re-used.
- 5. **Export income** to the companies exporting this tunable hydro metallurgic process system globally.



# VTT – beyond the obvious

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## Our vision

A brighter future is created through science-based innovations.

## Our mission

Customers and society grow and renew through applied research.

## Strategy

Impact through scientific and technological excellence.

Established in

**1942**

**268 M€**

Net turnover and  
other operating  
income (VTT  
Group 2018)

**2,049**

Total of personnel  
(VTT Group  
31.12.2018)

Owned by

Ministry of  
Economic  
Affairs and  
Employment

**31%**

Doctorates and  
Licentiatees  
(VTT Group  
2018)

**44%**

From the net  
turnover abroad  
(VTT Group  
2018)

# Proposal Introduction:

Management of enrichment processes

and water balance of mines by AI and on-line measurements



## I Measurements

- On-line measurements
- Soft-sensors
- Validation

## II Adjustment and control

- Process parameters
- Chemical input
- Models

## III Digital twin

- Water balance
- Concentrations
- Teaching and tuning of process





# Proposal introduction

- Ore samples from mines will be analysed in laboratories.
- The enrichment process will be emulated at Oulu Mining School
- The on-line measurements will be developed and validated in laboratories
- The hydro metallurgic processes will be modelled for AI.
- Process models will be developed, tuned (AI assisted). and piloted in test environments (like Oulu Mining School).
- Soft-sensor methods will be developed. and validated in laboratories.
- User interface for tuning and teaching the hydro metallurgic process will be piloted.

36  
*months*



# Partners



## **Finnish consortium**

- RTOs: VTT and University of Oulu
- Pilot mine: Hannukainen
- Sensor companies: Sensmet, Meoline, Timegate
- Room for a Finnish integrator or AI developer or AR/VR provider

**Discussions ongoing in Sweden, Norway and Poland.**

**Consortium is open for RTOs and companies collaborating with mines in Europe.**



# Contact Info



**For more information and for interest to participate please contact:**

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<https://www.vttresearch.com/en/topics/ai-big-data>

