



# Deployment of the Finnish Interoperability Platform in the Design of the Research Information Hub

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## Why

1. The details of researchers, publications, research datasets, research projects and research infrastructures will soon be available in one place.
2. There will be less reporting and administrative work as the data is available in a single location and information flows freely between services.
3. Results of both publicly and privately funded research will be openly accessible.
4. This will benefit researchers, research organizations, funding agencies, public administration and citizens.

# Search about research in Finland



Esim. tutkija, julkaisu, tieteenala, asiasana

Hae



Publications  
116 952



People  
15 887



Fundings  
1 622



Materials  
999



Infrastructures  
999



Research activities  
999



Organizations  
100



## Search for information

Etsi tietoa esim. tutkijoista, julkaisuista ja muista tutkimuksen tuotoksista sekä tutkimusinfrastruktuureista



## Tutki julkaisujen määrää tieteenaloittain

Etsi tietoa esim. tutkijoista, julkaisuista ja muista tutkimuksen tuotoksista sekä tutkimusinfrastruktuureista



## Search for information

Etsi tietoa esim. tutkijoista, julkaisuista ja muista tutkimuksen tuotoksista sekä tutkimusinfrastruktuureista

# UNDER DEVELOPMENT



## Search for information

Etsi tietoa esim. tutkijoista, julkaisuista ja muista tutkimuksen tuotoksista sekä



## Search for information

Etsi tietoa esim. tutkijoista, julkaisuista ja muista tutkimuksen tuotoksista sekä



## Search for information

Etsi tietoa esim. tutkijoista, julkaisuista ja muista tutkimuksen tuotoksista sekä

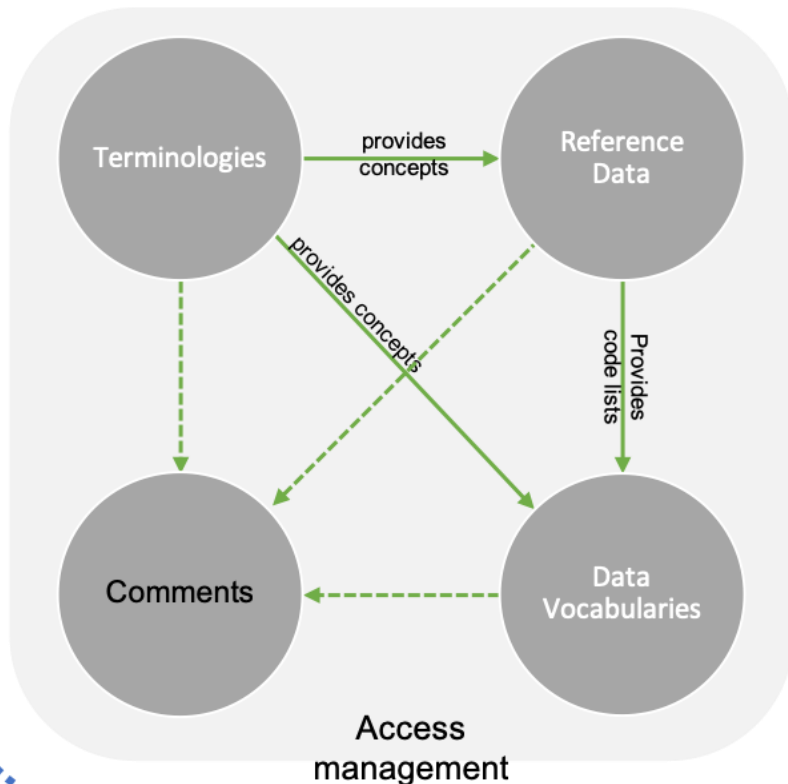


## Search for information

Etsi tietoa esim. tutkijoista, julkaisuista ja muista tutkimuksen tuotoksista sekä

# Interoperability platform and method: [yhteentoimiva.suomi.fi/](http://yhteentoimiva.suomi.fi/)

## Interoperability platform



## Interoperable Finland – background

- **CSC** initiated the development of the interoperability platform. Nowadays the **Population Registry Center of Finland** maintains and develops the service as a part of the national Suomi.fi-service concept.
- Thought has gone into how collaborative public IT service development should work in principle – this process of coordinated collaboration is the **interoperability method** – while the IT solution operationalising this method is termed the **interoperability platform**.
- One end goal is to change organisational behaviour in the public sector, break out of silo-thinking
- The rate of uptake varies in different fields of public administration

## Interoperability platform and method: [yhteentoimiva.suomi.fi/](https://yhteentoimiva.suomi.fi/)

- <https://sanastot.suomi.fi/> - in order for us to be able to use the same terms when utilising shared concepts – promotes human readable interoperability
- <https://koodistot.suomi.fi/> standardised lists of values (& codes) e.g. all Finnish academic institutions, Finnish municipalities, fields of science – from a single shared and updated source – so that interoperability does not suffer from conflicting or outdated written forms.
- <https://tietomallit.suomi.fi/> - transparency and openness in information system design – reusing components of pre-existing data models in own product development, is resource efficient and furthers interoperability between systems of diverse actors.

# Terminology Example

- The Finnish Public Sector Terminological Glossary is a controlled vocabulary consisting of terms representing concepts that are defined in accordance with the Finnish Public Sector Recommendation JHS175. The concepts form a shared and harmonized core vocabulary for all public sector organizations.

ALPHABETIC
HIERARCHICAL
COLLECTION

🔍
⋮

activity
applicant
definition
employee
event
home
**jurisdiction**
keyword
machine readable format
marriage
nationality
natural person
organization
party
payment
person

## jurisdiction

Suggested

**Preferred term** ⓘ

EN
jurisdiction
➤

**Definition** ⓘ

EN

A country, state, or other area where a particular set of laws or rules must be obeyed. For example, EU, Finland, UK,... E.g. personal data processing purposes are set and governed within a particular jurisdiction and its laws.

**Concept status** ⓘ

Suggested

---

Created at	Modified at
14.11.2018 18:43	14.11.2018 18:43

**URI**

<http://uri.suomi.fi/terminology/jhs/concept-775>

## Example - reference data

# National classification of education 2016

en ▾

Export ▾

Valid

Registry: JHS

Information domain:

Education and training

Organization: Statistics Finland

- + 03 - Social sciences, journalism and information Valid
- + 04 - Business, administration and law Valid
- 05 - Natural sciences, mathematics and statistics Valid
  - + 050 - Broad programmes and qualifications involving natural sciences, mathematics and statistics Valid
  - + 051 - Biological and related sciences Valid
  - + 052 - Environment Valid
  - + 053 - Physical sciences Valid
  - + 054 - Mathematics and statistics Valid



# An individual reference data item (list of research organisations)

Reference Data

koodistot.suomi.fi/code;registryCode=fairdata;schemeCode=organization;codeCode=10088

## 10088 - University of Eastern Finland

en Choose action

Draft Registry: Reference data for research data administration Code list: Research organizations Information domain: Education and training  
Organization: CSC - IT Center of Science

### INFORMATION

**Code list** ? Research organizations Cancel Save

**Code value** ? 10088

**Code name** ? EN University of Eastern Finland

Get concept from Terminologies

**Status** ? Draft

**Description** ?

# Example – data model

## Metax Research Datasets

Content in English ▾ Export ▾

Draft Information domain: General information and administrative services Organization: CSC - IT Center of Science

### DATAMODEL DEFINITION

### DATAMODEL DETAILS

CLASS ATTRIBUTE ASSOCIATION

Add class

- Activity
- Agent
- Catalog Record**
- Checksum
- Concept
- Directory in IDA
- Documented link
- Editor
- 10 Entity relation

## Catalog Record

Draft

Show history Export ▾ Remove Edit

### Shape information

#### Shape label ⓘ

Catalog Record

#### Shape id ⓘ

mrd:CatalogRecord 📄

#### Specialized from class ⓘ

dcat:CatalogRecord

#### Description ⓘ

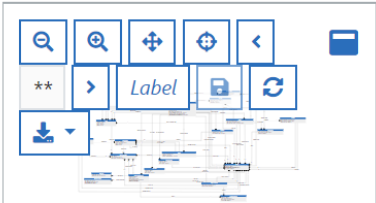
A record in a data catalog, describing a single dataset.

#### Status

Draft

#### Defined by profile ⓘ

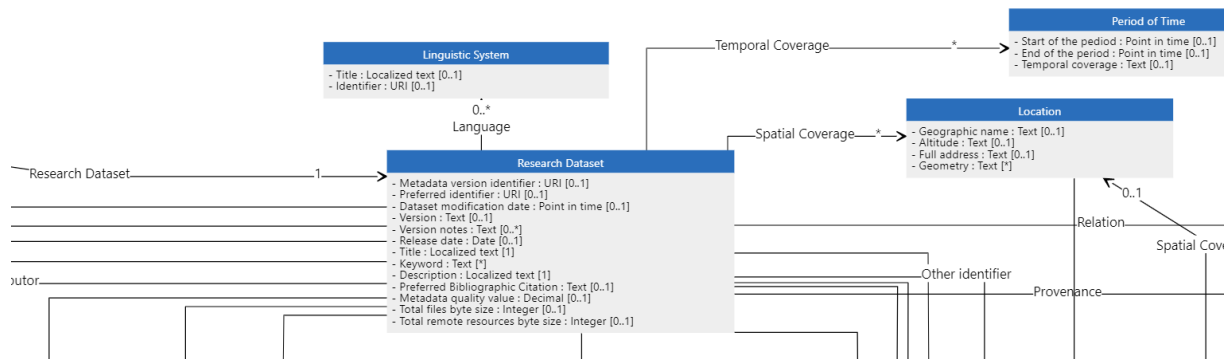
Metax Research Datasets



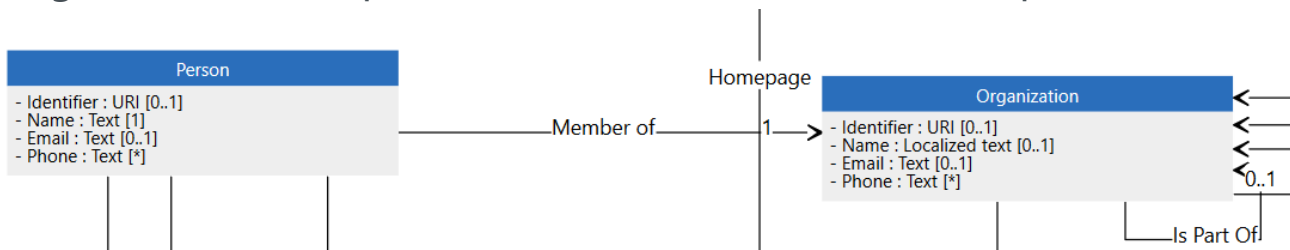


# <https://tietomallit.suomi.fi/> - data models

- Using UML schemas to describe data structures



- We can also utilise ontological relationships to describe information and export schemas as e.g. Turtle/RDF



## <https://tietomallit.suomi.fi/> - terminologies

- When creating a new information model, we can utilise the previously defined **terminologies**, reference data and model components

Hae sanastoja

 × 🔍

Sisältö suomeksi ▾

Nimi  Kuvaus

### [Julkisen hallinnon yhteinen sanasto](#)

The Finnish Public Sector Terminological Glossary is a controlled vocabulary consisting of terms representing concepts that are defined in accordance with the Finnish Public Sector Recommendation **JHS175**. The concepts form a shared and harmonized core vocabulary for all public sector organizations. (en)

<http://uri.suomi.fi/terminology/jhs/terminological-vocabulary-1>

# <https://tietomallit.suomi.fi/> - reference data

- When creating a new information model, we can utilise the previously defined terminologies, **reference data** and model components

Hae koodistoja

Nimi
  Kuvaus

Sisältö suomeksi ▾

Kaikki palvelimet  
 koodistot.suomi.fi  
 OPH koodistopalvelu

Kaikki ryhmät ▾

Kaikki tilat ▾

**Tutkimusorganisaatio**

Kaikki koodistot

---

**Tutkimusaktiviteettien roolit**

Tutkimushallinnon koodistot

---

Alayksikkökoodit **tutkimus**laitokset

**tutkimus**laitosten alayksikkökoodit

Kaikki koodistot

---

**Tutkimusaineistojen pysyvät tunnisteet**

Tutkimusaineistojen koodistot

**Koodiston tiedot**

**Koodiston URI** ⓘ

<https://virikailija.opintopolku.fi/koodisto-service/rest/json/tutkimusorganisaatio/koodi>

**Koodiston nimi**

Tutkimusorganisaatio

**Koodiston tila**

Luonnos

Tunniste	Nimi	Tila
<a href="#">01714953</a>	Kuopion yliopistollisen sairaalan erityisvastuualue	Luonnos
<a href="#">02022481</a>	Suomen Pankki	Luonnos

# https://tietomallit.suomi.fi/ Linking with: 1. Terminologies/controlled vocabularies 2. Reference data

## Information domains \*

[Add domain](#)



### Name

Education and training



## Contributors \*

[Add contributor](#)

### Name

CSC - IT Center of Science



## Terminologies

[Add vocabulary](#)

### Terminology name

**Modified  
Status at**

Finnish Public Sector Terminological Glossary (Controlled Vocabulary)



OKSA - Opetus- ja koulutussanasto (fi)



## Reference data

[Add reference data](#)

### Reference data name

**Status**

Research organizations

Draft



Tutkimusaktiiviteettien tyypit (fi)


Draft




# Designing CERIF compatibility - interoperability

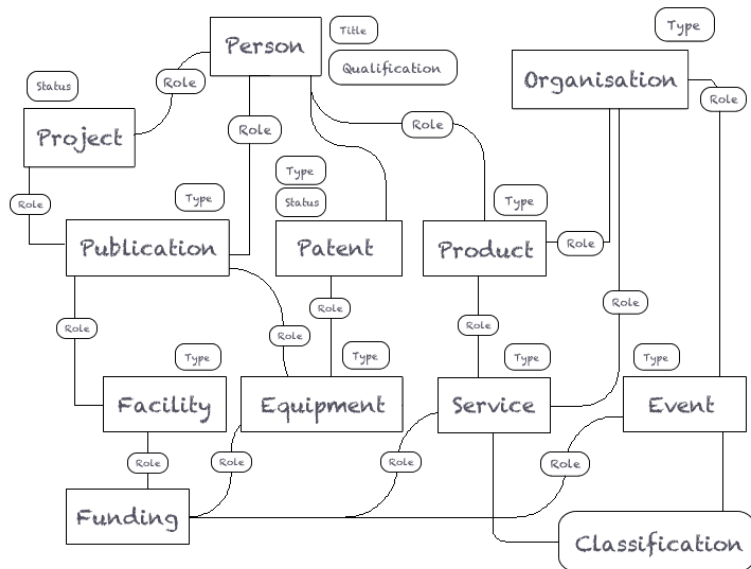
Import namespace ✕

**Namespace label \***

**Namespace  \***

**Prefix  \***

Create new
Cancel










# Designing CERIF compatibility – interoperability

## Linking with: 3. other internal models or external namespaces



### Imported namespaces

[Import namespace](#)

Prefix	Namespace label	Namespace
cerif	The Common European Research Information Format (CERIF) Ontology Specification	<a href="http://www.eurocris.org/ontologies/cerif/1.3#">http://www.eurocris.org/ontologies/cerif/1.3#</a>  
edu	Core Vocabulary of Education	<a href="http://uri.suomi.fi/datamodel/ns/edu#">http://uri.suomi.fi/datamodel/ns/edu#</a> 
jhs	Finnish Public Sector Core Data Components	<a href="http://uri.suomi.fi/datamodel/ns/jhs#">http://uri.suomi.fi/datamodel/ns/jhs#</a>
semcerif	The Common European Research Information Format (CERIF) Semantic Vocabulary	<a href="http://www.eurocris.org/ontologies/semcerif/#">http://www.eurocris.org/ontologies/semcerif/#</a>  

# Referencing CERIF in defining a class for the Research Information Hub



CLASS ATTRIBUTE ASSOCIATION

**Add class**

- Contact information
- Degree
- Hanke (fi)
- Organization
- Person
- Tieteenala (fi)
- Tutkija (fi)**

## Tutkija (fi) - Researcher

Draft

Show history Export Remove Edit

**Class information**

**Class label** ⓘ  
Tutkija (fi)

**Class id** ⓘ  
tutkimus:Tutkija

**Superclass** ⓘ  
jhs:Henkilo

**Description** ⓘ  
henkilö, joka ammattimaisesti tieteellisiä menetelmiä käyttäen tekee tutkimusta (fi)

**Status**  
Draft

**Defined by Core Vocabulary** ⓘ  
Tutkimuksen tietokomponentit (fi)

**Equivalent class** ⓘ  
semcerif:Researcher, mrd:Person

💡 tutkija (fi)

**Concept definition**  
henkilö, joka ammattimaisesti tieteellisiä menetelmiä käyttäen tekee tutkimusta (fi)

**Terminology** ⓘ  
Tutkimushallinnon sanasto (fi)

## Class attributes and associations

Add attribute or association ▾

### Identifier

Draft

Delete attribute

**Attribute information**

**Class attribute label** ⓘ \*  
Identifier

**Range** ⓘ \*  
URI (xsd:anyURI) ▾

**Reference data**  
Not defined  
**Add reference data**

**Optional metadata**

**Class attribute localname** ⓘ  
identifier

**Description** ⓘ  
An unambiguous reference to the resource within a given context.

**Status**  
Draft ▾

**Regular expression** ⓘ

# Exporting the defined model as RDF

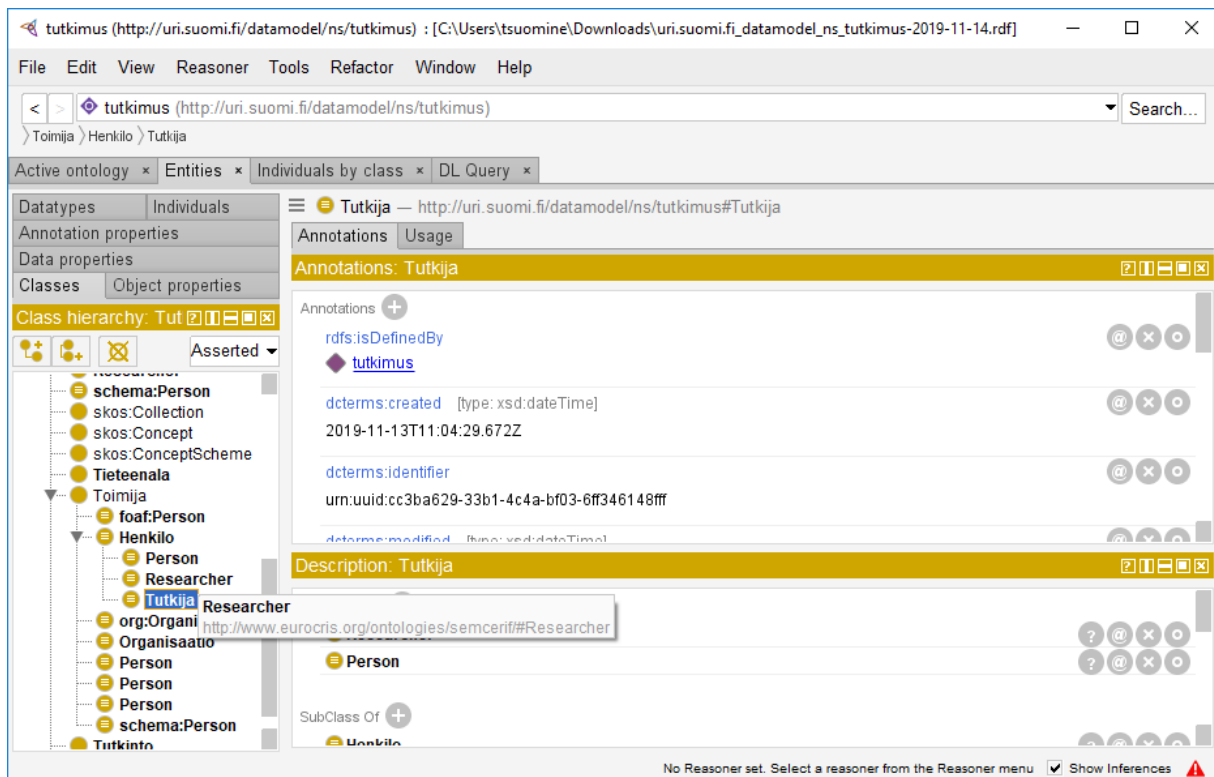
## Namespace export

```
xmlns:semcerif="http://www.eurocris.org/ontologies/semcerif/#"  
xmlns:julkaisu="http://uri.suomi.fi/datamodel/ns/julkaisu#"  
xmlns:at="http://publications.europa.eu/ontology/authority/"  
xmlns:ttv_tt="http://uri.suomi.fi/datamodel/ns/ttv_tt#"  
xmlns:afn="http://jena.hpl.hp.com/ARQ/function#"  
xmlns:schema="http://schema.org/"  
xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#"  
xmlns:void="http://rdfs.org/ns/void#"  
xmlns:owl="http://www.w3.org/2002/07/owl#"  
xmlns:httpv="http://www.w3.org/2011/http#"  
xmlns:jhs="http://uri.suomi.fi/datamodel/ns/jhs#"  
xmlns:cerif="http://www.eurocris.org/ontologies/cerif/1.3#"  
xmlns:skosxl="http://www.w3.org/2008/05/skos-xl#"
```

## Cerif mapping in the body

```
<rdf:type rdf:resource="http://www.eurocris.org/ontologies/cerif/1.3#Researcher" />  
<rdf:isDefinedBy rdf:resource="http://uri.suomi.fi/datamodel/ns/tutkimus"/>  
<dcterms:subject rdf:resource="http://uri.suomi.fi/terminology/tuha/concept-145"/>  
<rdfs:subClassOf rdf:resource="http://uri.suomi.fi/datamodel/ns/jhs#Henkilo"/>  
<owl:equivalentClass rdf:resource="http://uri.suomi.fi/datamodel/ns/mrd#Person"/>  
<owl:equivalentClass rdf:resource="http://www.eurocris.org/ontologies/semcerif/#Researcher"/>  
<sh:name xml:lang="fi">Tutkija</sh:name>  
<sh:description xml:lang="fi">henkilö, joka ammatillisesti tieteellisiä menetelmiä käyttäen tekee tutkimusta</sh:description>  
<prov:wasDerivedFrom rdf:resource="http://uri.suomi.fi/datamodel/ns/ttv_tt#Tutkija"/>  
</rdf:Description>
```

# Now we can work with the model in other environments..



The screenshot shows the Protege ontology editor interface. The main window displays the 'tutkimus' ontology (http://uri.suomi.fi/datamodel/ns/tutkimus). The left sidebar shows a class hierarchy with 'Tutkimus' selected. The main area shows the 'Annotations' tab for the 'Tutkimus' class, listing properties like 'rdfs:isDefinedBy', 'dcterms:created', and 'dcterms:identifier'. The 'Description' tab shows the class 'Person' as a subclass of 'Henkilo'.

Active ontology: **tutkimus** (http://uri.suomi.fi/datamodel/ns/tutkimus)

Class hierarchy: Tutkimus

- schema:Person
- skos:Collection
- skos:Concept
- skos:ConceptScheme
- Tieteenala
  - Toimija
  - foaf:Person
  - Henkilo
    - Person
    - Researcher
    - Tutkimus** Researcher
    - org:Organisaatio http://www.eurocris.org/ontologies/semcerif/#Researcher
    - Organisaatio
    - Person
    - Person
    - Person
    - schema:Person
    - Tutkimus


Annotations: Tutkimus

- rdfs:isDefinedBy
  - tutkimus
- dcterms:created [type: xsd:dateTime]
  - 2019-11-13T11:04:29.672Z
- dcterms:identifier
  - urn:uuid:cc3ba629-33b1-4c4a-bf03-6ff346148fff
- dcterms:modified [type: xsd:dateTime]

Description: Tutkimus

- Person

SubClass Of: Henkilo

No Reasoner set. Select a reasoner from the Reasoner menu  Show Inferences 

# Interoperability design evolution ?

## Current

Customised data model

Customised implementation

Interoperability achieved through customized APIs, where the connections to other standards are created manually

## Under way

Customised data model on interoperability platform , with mappings to selected standards

Mappings to other standards preserved in the implementation

Interoperability achieved through a generic API, that utilizes internal interoperability knowledge

## Future?

Importing external datamodels into the interoperability platform, utilising and extending the standard directly

The mapping to other standards preserved in the implementation

Interoperability achieved through a generic API, that utilizes internal interoperability knowledge



### Thank you for your attention!

I am Tommi Suominen. I recently started at CSC as an information architect.

[www.linkedin.com/in/tommi-suominen-935b5a8a](https://www.linkedin.com/in/tommi-suominen-935b5a8a)



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[github.com/CSCfi](https://github.com/CSCfi)