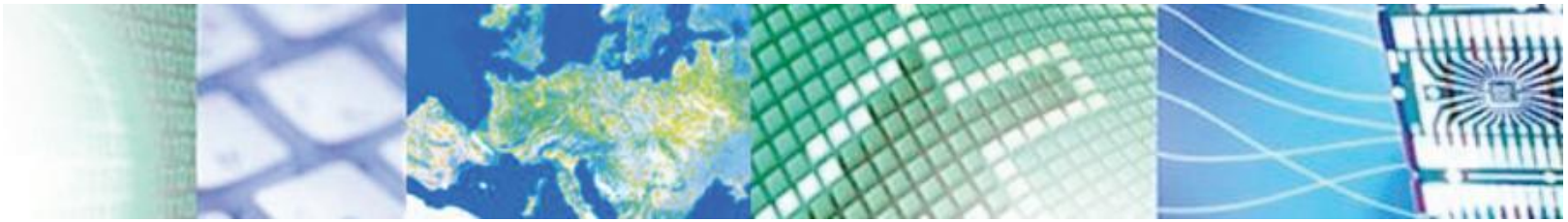

CHIST-ERA Projects Seminar 2022
Novel Computational Approaches for Environmental Sustainability (CES)

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Introduction: Projects of the Topic

Call Topic: Novel Computational Approaches for Environmental Sustainability (CES), Call 2019

4Map4Health - Mapping of forest health, species and forest risks using Novel ICT Data and Approaches

SWAIN - Sustainable Watershed Management Through IoT-Driven Artificial Intelligence

SEC-OREA - Supporting Energy Communities- Operational Research and Energy Analytics

WATERLINE - New Solutions for data assimilation and communication to improve hydrological modelling and forecasting

ANDROMEDA - Advanced and novel hydrology models based on enhanced data collection, analysis, and prediction

Major Achievements and Outputs

Publications:

- **TOTAL: 6 journal articles and 11 conference papers**
- 4Map4Health: 1 journal paper, 1 accepted
- SWAIN: 2 journal, 1 conference
- WATERLINE: 2 journal, 3 conference
- SEC-OREA: 3 conference papers
- ANDROMEDA: 3 conference papers, 1 journal (under review)

Workshops:

- In person workshops (2);
- Kickoff workshops online (3).

Major Achievements and Outputs

Acquired data:

- Multispectral laser scanning data from project forest test sites
- Consolidated Geo-Database of water quality data from Ergene and Kokemäki rivers
- Downscaling of remotely sensed soil moisture, precipitation and total water storage datasets
- Drone IR data to acquire information of groundwater surface water interactions
- ERA-5 Hourly weather data (wind speed, precipitation, relative humidity, pressure, temperature).
- prosumerGridModel https://github.com/tarmokorotko/prosumerGridModel, MIT Licence

Major Achievements and Outputs

Impacts:

We expect improved estimation and prediction for tree species of living trees and amount of dead wood, forest health and forest risk management

An AI-assisted sensor and gateway placement mechanism for remote environments optimizing:

1. Information: quality and quantity of the data that can be collected
2. Communication: amount of data that can be transmitted for analysis
3. Energy: battery consumption and ecological footprint

Improve the usefulness of remotely sensed datasets through downscaling

Upcoming Challenges and Needs

Our long-term vision is to provide novel technological solutions and data, and develop better ICT methods for such data in order to be able to make more advanced estimates, and that way to permit timely and well informed decision making in the future.

Interdisciplinarity: projects combine computational, geospatial, forest, environmental and engineering sciences, data mining, remote sensing, sensor technologies, physics…challenges of field trials and data acquisition.

SEC-OREA aims to enable local energy communities (LECs) to participate in the decarbonisation of the energy sector by developing advanced efficient algorithms and analytics technologies. Grid codes and regulations are changing.

Multi source datasets are expected to improve modelling efforts and forecasts.

Possible Roadmap

- Explore opportunities for environmental data gathered by sensor networks to be curated for sharing with other researchers;
- Better data permits better decisions. This affects decision makers, industry, environmental administrations and society.
- Outputs are shared through open access publications and open datasets in public repositories
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Role of the CHIST-ERA Support

1. Besides the scientific challenges and needs there is a serious problem concerning funding for the two Greek partners which is still pending due to bureaucratic issues within the Greek funding agency (GSRT)
2. Serious problems for smooth project implementation as the coordinating partner has not yet joined the project officially!!!!!
3. CHIST-ERA should try to enforce the smooth funding flows in all partners.
4. In exceptional conditions there should be help provided to partners experiencing those adverse impacts
5. All participating countries funding agencies should follow the same rules at least as far as funding flow is concerned
6. COVID pandemic has seriously impacted project implementation- There is need for face to face collaboration
7. Organize centralized support to attract Widening Countries, informing projects about specific opportunities, countries remaining with unspent budget
8. A collaboration agreement template not based on the centrally funded Horizon model would be useful since the CHIST-ERA projects are funded nationally
9. Shorten projects evaluation process

Responsible Research & Innovation

- Ecological footprint of the sensor networks (which are prevalent in almost all projects) has to be taken into consideration
- Importance of including “fair” constraints and objectives in optimisation models to ensure societal equality and sustainability goals
- Public engagement is important for all CES2019 projects

Open Science

- Project results are published in open access journals
- When this is not possible, full texts are deposited into open archives.
- Open datasets are available in public repositories
- Open access to some datasets are delayed until corresponding papers are published or until after the end of the project.

Technology Transfer

- Industry and end-users are involved in project interaction group
- International universities are involved in a data processing benchmarking study
- All CES 2019 projects are at a relatively early stage.

Questions

Questions ?