Green Software and Human Actors: design, code, and behavior - community workshop

Dr Adel Noureddine
Associate Professor
University of Pau and Pays de l'Adour

Dr Guillaume Rivière
Assistant Professor
Estia Institute of Technology

5 June 2023

About us

Adel Noureddine

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Associate Professor in Computer Science
@University of Pau and Pays de l'Adour
@LIUPPA laboratory

Researcher in Green IT, Software Engineering and Autonomic Computing

noureddine.org ⬈

PRESENTATION

GUILLAUME RIVIÈRE

Assistant
Professor
at ESTIA

Assistant Professor

- Since 2011, at ESTIA Institute of Technology (France)
- Human–Computer Interaction
- Interaction with Tangible Interfaces

Energy

- **GeoTUI (2008)**: An interactive tangible tabletop for subsoil exploration in geosciences
- **StationENR (2012)**: A tangible kiosk to raise renewable energy awareness
- **CairnFORM (2019)**: A shape-changing tangible interface to notify on public spaces the forecasts on local renewable energy availability

Workshop Context and Goals

Context

- ICT energy costs are continuing to rise, and is expected to amount 14% of 2016's levels of GHGE (Belkhir et al., 2018).
- Up to 6% of global electricty use in 2020 (Ross et al., 2022).
- Up to 20% of electricity use in 2030 (Enerdata, 2018).
- Energy costs includes server-side, routing-side and client-side.
- Trade-offs between satisfying users needs and energy consumption?

Current Solutions

- Technical solutions and approaches (measuring software consumption, optimizing hardware and network, software eco-design).
- Social and behavioral approaches (feedback, gamification, changing user behaviors).
- Design approaches (designing green web pages, or designing green interfaces).

Workshop Goal

- Achieving the ambitious goals for sustainability requires collaboration between different research disciplines and domains, as the impact of technological-only optimizations slows down.
- Bring the research and practitioners communities together: software engineerinig, UX/UI design, and behavioral studies.
- Brainstorm on holistic solutions: how to combine our research to find a global & sustainable solution?

Research Challenges

Workshop Research Challenges

- How to guide user interface designers for energy-efficient interaction?
- How to assist end users for energy-efficient interaction?
- How to provide data to end users for energy-efficient digital behavior?

Workshop Program

Hour	Topic
11:00	Welcome and research challenges
11:30	Keynote by Aurélie Baton: Eco-design: What is the role of design in building sustainable services?
12:30	Lunch
14:00	Talk by Adel Noureddine: Software Energy Efficiency: Between Technical and Human Approaches
14:30	Talk by Guillaume Rivière: HCI and Climate Change: Toward New Directions
15:00	Workshop presentations
15:30	Break
16:00	Passionate discussion - brainstorming report
17:30	Closing

Workshop presentations

- Shaping the hidden environmental impacts of software (Thibault Simon, Pierre Rust, Romain Rouvoy. Orange Labs, University of Lille, Inria).
- Beyond energy: when software makes hardware obsolete (Aurélien Tabard, Edlira Nano, Lea Mosesso, Nolwenn Maudet, Camille Adam, Thomas Thibau. Université Claude Bernard-lyon 1, Inria Lille, Université de Strasbourg, CNRS).
- Coca4AI: How to measure and raise the awareness of data scientists ? (Paul Gay, GreenAI).

Keynote

Aurélie Baton
EcoByDesign, UX designer, Sustainable Design

Aurélie is a freelance UX designer, she tries to combine eco-design, systemic design and accessibility to build more sustainable products.
She is also a member of Designers Ethiques, a French NGO that focuses on topics related to the responsibility of designers.

Eco-design: What is the role of design in building sustainable services?