



A critical reflection for Cognitive Ergonomics in Europe for today and for a better tomorrow

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Abstract

Abstract: The panel on the present and future of cognitive ergonomics in Europe will explore the views of leading figures in cognitive ergonomics in Europe, in the context of a critical reflection for a better tomorrow. The panel's origin is from an interactive event at ECCE-2024 in Paris and uses the findings from that discussion to position and contextualise the goals and ambitions for this panel, setting out key objectives to be discussed. The panel will then discuss and debate the position of cognitive ergonomics in today and tomorrow's world.

CCS Concepts

• **Human-centered computing** → **HCI design and evaluation methods; HCI theory, concepts and models; Interaction design.**

Keywords

Cognitive ergonomics, Human computer interfaces, Human-centred design

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1 Introduction

Fitting within the theme for the European Conference on Cognitive Ergonomics in Tallinn in 2025 which is 'Critical reflection for a better tomorrow', this panel proposes a debate on the value of cognitive ergonomics in today's digital world as well as provoking discussion and reflection on its role for a better tomorrow.



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As interface technologies and paradigms evolve at pace and in tandem with explosive growth in innovations in generative AI and large language model development, this panel has been constituted to explore the current and future trends, opportunities, threats and issues in education and research communities for the field of cognitive ergonomics (Figure 1).

During an active and interactive digitally moderated discussion at the ECCE conference in 2024 in Paris, cognitive ergonomics, grounded in disciplines such as cognitive psychology, computer science, and human factors, was recognised as evolving through technological and methodological shifts with European regional emerging paradigms reflecting diverse academic and industrial contexts, from Scandinavian participatory design [5], British psychological frameworks [4], Italian automation methodologies [2] [1], Spanish user's mental model of the system [6], French task analysis [3], and interdisciplinary German approaches [7]. Cognitive ergonomics was placed in its historical contextual origins in addressing issues of human error and usability in early computing contexts, then progressing from individual-focused models germinating to complex socio-technical and human-AI systems we experience today.

In Paris, the discussion underscored the continued importance of cognitive ergonomics in guiding responsible technological innovation and it called for stronger collaboration between researchers, industry, and policymakers, as well as identifying the need for a shared and deep understanding of its evolving role in shaping human-centred digital technologies that are now pervasive and ubiquitous in our daily lives. In Tallinn in 2025, we wish to take the conversation further with a provocative and lively debate and reflection of the role of cognitive ergonomics in today and tomorrow's better worlds.

2 Objectives

The objectives of this panel then are to:

- Explore and evaluate the current understanding of cognitive ergonomics
- Summarise the strengths and weaknesses of cognitive ergonomics in today's world
- Explore how and in what contexts cognitive ergonomics can be best positioned within research and design communities to expand engagement

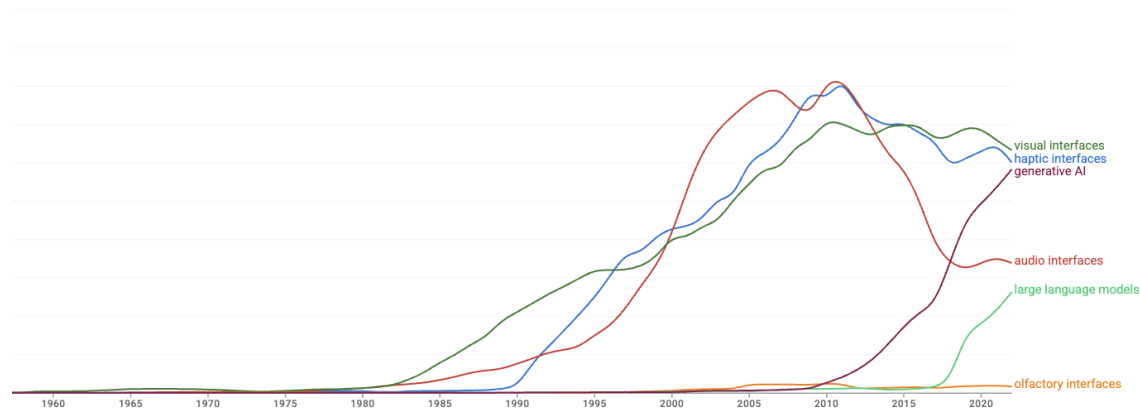


Figure 1: Google Ngram Viewer visualisation of results for key interface and generative AI terms 1960-2022. Credits: [8], [9].

- Discuss where cognitive ergonomics makes a critical practical difference in society
- Explore how to keep cognitive ergonomics education up to date, and to which disciplines we should be teaching which aspects
- Explore how cognitive ergonomics may perhaps be applied in a different way or focus in an AI future
- Investigate how Generative AI is a friend or a foe to cognitive ergonomics
- Explore ethical issues, from past to future, of cognitive ergonomics in production and research contexts

3 Panel design and method

The panel will be selected from European Association of Cognitive Ergonomics board members along with registered attendees at ECCE in Tallinn, reflecting age, gender and perspective on the topic. The maximum panel size is 6 people, including chair. The panel chair will set out the objectives of the panel session, then invite each panel member to present their views on the present state of cognitive ergonomics in Europe. The panel will then open up to audience comment and debate, before the second phase where each panel member will present and discuss the possible futures for cognitive ergonomics in Europe, exploring the threats and opportunities provided by new technological and societal changes.

4 Expected outcomes

This panel on the present and future of cognitive ergonomics in Europe will help identify clear pathways for use of cognitive ergonomics for the research and innovation communities in academia and industry. It will help position cognitive ergonomics in the research spaces around human-computer interaction, ergonomics, human-centred computing, and the broader societal milieu of computer-moderated interaction and engagement, guidance, and support with humans.

Importantly, it will help guide the research community in Europe with practical knowledge and understanding of the critical relevance and power of cognitive ergonomics to devise humanity-centred methods and tools that result in better, fairer and more

transparent platforms for engagement and indeed enjoyment for Europe’s citizens and workers.

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