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# 50 years of Research in Engineering Interactive Computing Systems: the CCL 1974 to EICS 2024 journey

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## ABSTRACT

This panel commemorates the 50th anniversary of the IFIP TC2 Working Conference on Command Languages (CCL) and the 30th anniversary of the workshop series on Design Specification and Verification of Interactive Systems (DSV-IS), and uses that opportunity to position EICS within the HCI community. The discussion traces the origins of the EICS conference, from the union of seminal conferences to its current status and looks forward into its (possible) future. Reflecting on its contributions to the evolution of HCI methodologies, tools, and practices, the panel highlights the conference's role and impact on shaping the engineering of interactive systems.

## CCS CONCEPTS

• **Human-centered computing** → **Interactive systems and tools**; • **Software and its engineering**;

## KEYWORDS

interactive systems, user interfaces, software engineering, model-driven engineering, model-based design of user interfaces, formal methods, design, history

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## 1 INTRODUCTION

The ACM Symposium on Engineering Interactive Computing Systems (EICS) stands at the crossroads of Human-Computer Interaction (HCI) and Software Engineering (SE), gathering together researchers and practitioners working on the complex and interdisciplinary field of interactive system development.

EICS has a unique position in the HCI scientific community and it is clearly characterised with respect to other related venues. At its heart, EICS is dedicated to the lifecycle of interactive systems and their user interfaces. Traditional Software Engineering applies systematic techniques to develop software products. EICS covers all stages of the engineering lifecycle of *interactive* systems (from prototypes to complex industrial applications). This includes inception, requirements, design, specification, coding, data analytics, validation and verification, deployment and maintenance. While it encompasses the entire process, from specification and design to development and testing, EICS is not merely about creating software, but about crafting systems for interactive experiences that are functional, usable (effectiveness, efficiency, and satisfaction in a specified context of use) and engaging.



Figure 1: Participants of DSV-IS '94 [26], the first DSV-IS.

Even if established as an ACM conference in 2009, EICS stands out in the landscape of HCI conferences due to its long history rooted into the combination of several foundational conferences (DSV-IS, CCL, EHCI, CADUI, and TAMODIA), each with its peculiar legacy and contributions to the field. This resulted in a unique venue that encapsulates a broad spectrum of HCI research and practice. The conference had and still keeps the ability to adapt and incorporate emerging topics in the dynamic and evolving field of interactive systems.

In 2024, we celebrate the 50th anniversary of the CCL conference and the 30th anniversary of DSV-IS through a panel for discussing the unique position of EICS within the HCI community, tracing its origins from the union of seminal conferences to its current status and looking forward into its (possible) future. We will share anecdotes and pivotal moments that have shaped EICS, reflecting on its contributions to the evolution of HCI methodologies, tools, and practices. The discussion will highlight the conference's role in fostering a cohesive community and its impact on shaping the engineering of interactive systems.

## 2 A BRIEF SUMMARY OF A LONG HISTORY

The Engineering Interactive Computing Systems (EICS) conference, officially inaugurated under the sponsorship of ACM SIGCHI in 2009, has one of the most extensive histories among Human-Computer Interaction-related conferences. The 2024 edition marks the golden jubilee of the first Conference on Command Languages (CCL) and the 30th anniversary of the first Design, Specification, and Verification of Interactive Systems (DSV-IS) workshop, both of which played key roles in the origin of EICS.

Figure 4 shows the path that led to the first edition of EICS. The most extended branch task refers to 1974 [32] (cited in [13]), when the first Conference on Command Language took place (a milestone we celebrate in 2024). Throughout the years, it evolved into an IFIP Working Conference on Command Language and the IFIP Conference on Engineering HCI (EHCI), organised as a standalone event until 2001 [17]. EHCI was run as a triennial event.

A second branch started 30 years ago with the first edition of the Eurographics workshop on Design, Specification, and Verification



Figure 2: Participants of DSV-IS '96 [3], the third DSV-IS.



Figure 3: Participants of CADUI '96 [33], the second CADUI.

of Interactive Systems (DSV-IS). Over time, the event evolved to become a standalone international workshop, and run from 1994 [26] to 2008 [12]. DSV-IS placed a special emphasis on formal methods, providing a forum to investigate the design and specification of interactive systems, along with their properties at the interaction level that are suitable for formal verification.

The third branch is the International Workshop on Computer-Aided Design of User Interfaces (CADUI), organised every two years since 1993 (first published online proceedings in 1996 [33]) to 2008 [18]. While DSV-IS welcomed any contribution related to the software engineering aspects of user interfaces, such as software architectures, models, and methods, CADUI put some emphasis on supporting the user interface development life cycle as much as possible, often based on the software architectures, models, and methods devised in DSV-IS. It followed the same trend existing at that time for computer-aided design of information systems.

The last thread to follow for discussing the origin of EICS is the Annual Conference on Task Models and Diagrams (TAMODIA) focusing on task models and notations, which ran independently from 2002 [29] to 2009 [8]. With the advent of the task model recognised

as one of the key starting points for initiating the user interface development life cycle. Several efforts have been made to get the best of task models proposing languages, tools, and task-model-based approaches for interactive systems design and evaluation.

The aforementioned venues had overlapping topics, and there have been different attempts to join under a single event. For instance, in 1996, CADUI [33] and DSV-IS [3] had a joint organisation. DSV-IS also joined the organization with EHCI in 2004 [2] and 2007 [14].

Given the shared focus on the engineering aspects of Human-Computer Interaction, such as techniques, tools, and the practice of the software engineering life-cycle of interactive systems, those attempts eventually resulted in the effort of establishing a premier conference in this scientific field. In 2009, the thread resulting from DSV-IS and EHCI originated the first EICS edition [11], which was joined the next year [31] by TAMODIA and CADUI. One key aspect of the evolution was that EICS became an ACM SIGCHI sponsored conference with proceedings published in the ACM Digital Library. Since 2017, EICS full papers are published in the ACM Proceedings on Human-Computer Interaction journal (PACM-HCI).

Since its start, EICS has been an annual event that gathers a strongly tied community that shares an interest in engineering interactive systems. Over time, the topics addressed at the conference have broadened, considering emerging technologies and approaches, including cross-device user interfaces, extended reality, human-robot interaction, and end-user development. The panel will recall this history through anecdotes and memories, keeping an eye on the future of the conference.

### 3 PARTICIPANTS

**José Creissac Campos** (panellist) is an associate professor at the Universidade do Minho and a senior researcher at HASLab/INESC TEC. His first workshop was DSV-IS 1997 [15]. He was conference co-chair for EICS 2012 [1], EICS 2017 [5] and EICS 2024, and program committee co-chair for EICS 2016 [20]. He also was chair of the EICS steering committee from 2020 to 2024, and of the IFIP Working Group 2.7/13.4 on User Interface Engineering from 2016 to 2022.

**Kris Luyten** (panellist) is a full professor in Computer Science at Hasselt University, and deputy managing director of the Expertise Centre for Digital Media – a Flanders Make core lab. He is also a Principal Investigator for the Flanders AI Research Program. His first workshop was the International Workshop on Design, Specification, and Verification of Interactive Systems (DSV-IS) 2021 [16] in Glasgow. Since then, he was involved in the community in various ways, a.o. as a program chair for TAMODIA 2006 [6], he was full paper and technical notes co-chair for EICS 2011 [27], EICS 2013 [9], EICS 2022 [35] and EICS 2023 [7], and conference chair for EICS 2016 [20] and EICS 2018 [21].

**Laurence Nigay** (panellist) Laurence Nigay is a professor at Université Grenoble Alpes. She has been a member of the IFIP 2.7/13.4 WG on User Interface Engineering since 1993, and co-chair of this group from 1998 to 2004. She has contributed to the EHCI conference since 1992. At this conference (EHCI 1992), she published two papers, one on software architecture and the other on the properties of interactive systems. She was program co-chair

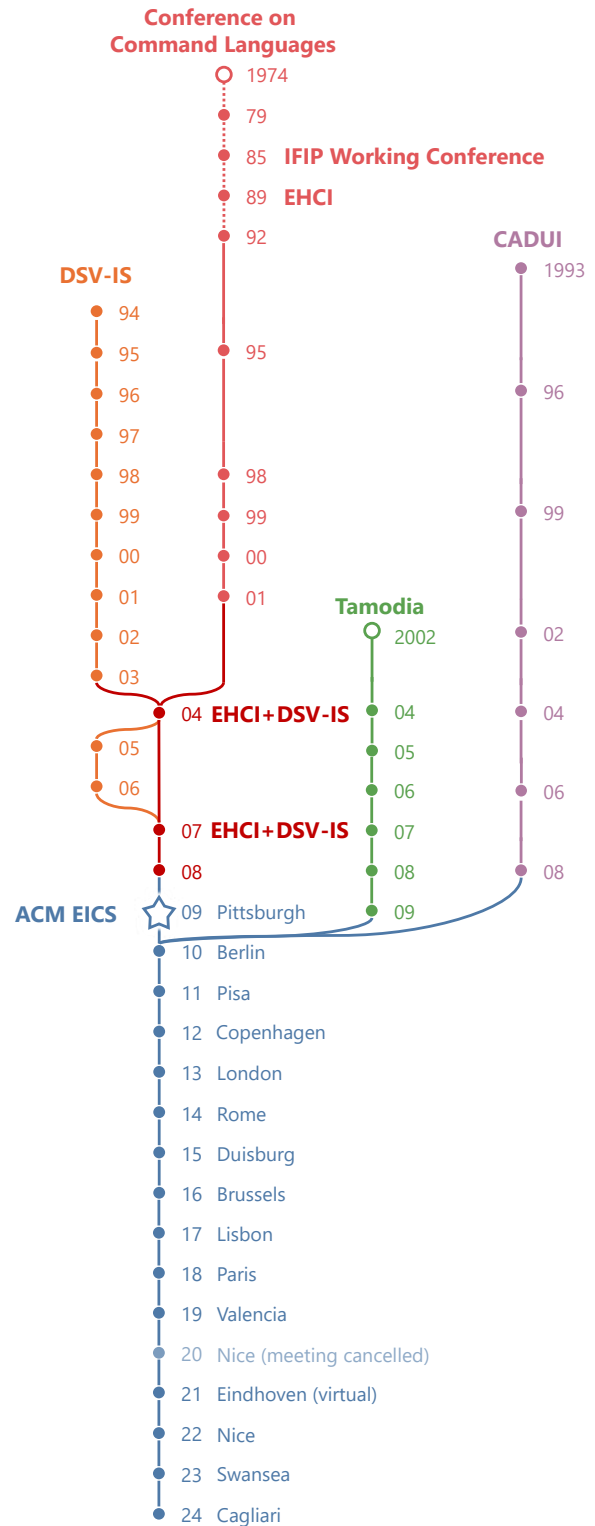


Figure 4: A visual illustration of the history of the events that eventually joined EICS in 2009. The image has been adapted from the original version in [19].

of EHCI 1998. Since then, she has participated in and contributed to the EHCI conference, then the EIS conference and finally the EICS conference (e.g. as proceedings co-editor, paper co-chair and doctoral consortium co-chair).

**Philippe Palanque** (panellist) is professor at the Université Toulouse III - Paul Sabatier in Toulouse France. He has been the conference co-chair of DSV-IS 1995 [23], DSV-IS and EHCI 2004 joint event [2], HESSD and TAMODIA 2009 joint event [8] and EICS 2016 [20]. He also was Program Committee chair of EHCI 2001 [17], EICS 2012 [1], EICS 2021 [22] and EICS 2022 [35].

**Fabio Paternò** (panellist) is a Research Director at CNR-ISTI, where he leads the Laboratory on Human Interfaces in Information Systems (HIIS). He was the chair of DSV-IS'94 (in Bocca di Magra), EICS 2011 (in Pisa), and EICS 2014 (in Roma). He was the chair of the IFIP 2.7/13.4 WG on User Interface Engineering in the period 2010 - 2012. He has also actively been involved in several other HCI events, including general co-chair of ACM IUI 2025.

**Jean Vanderdonckt** (panellist) is a full professor at Université catholique de Louvain, Belgium, since 1998. He has been conference (co-)chair of DSV-IS '96, all CADUI editions from 2002 to 2008, TAMODIA '02, TAMODIA '09 [8] (which was jointly organised with HESSD '09 [24]), ACM IUI '04 [34], EICS '10, EICS '19 [25], and PC Chair of DSV-IS '02 [10] and EICS '20 [4].

**Lucio Davide Spano** (moderator) is an Associate Professor at the University of Cagliari since 2019. He is chair of the IFIP 2.7/13.4 WG on User Interface Engineering since June 2022 and Delegate for the Research of the Extended Committee of SIGCHI-Italy. He is the General Co-Chair of EICS 2024 and, previously, he has been General Chair of IS-EUD 2023 [30] and Programme Co-Chair for IUI 2020 [28].

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