

Addressing Complexity in Consumer Technologies and Applications: A Transdisciplinary Dialogue

The 2022 *IEEE International Symposium on Digital Privacy and Social Media* (ISDPSM 2022), held in Silicon Valley, San Jose, California, USA on August 1 2022, provided a forum for diverse stakeholders to meet on topics relevant to consumer technologies, digital privacy and social media. Stakeholders from industry, academia and government contributed to the symposium theme: "*Applying Engineering Solutions to a Complex Set of Issues*" to consider diverse perspectives on consumer technologies.

This call aims to document and further the dialogue between a variety of stakeholders in the consumer technologies and applications innovation ecosystem (Etzkowitz & Leydesdorff, 1995; Carayannis et al., 2021) with respect to Digital Privacy and Social Media. Submissions include, but are not limited to, industry, government bodies and regulatory agencies (local, state and federal), non-government organizations with an advocacy focus (e.g. consumer action, privacy rights, security), not-for-profits dedicated to the rights of children and professionalization of the tech sector, academic research institutions, professional institutions, standards bodies (e.g. anonymity, identity), civil society (citizens/consumers/users), among other stakeholders (Farthing et al., 2021).

Interdisciplinary approaches to innovation are essential for the design and development of consumer technologies and applications acknowledging the objectives of various stakeholders (Crow & Dabars, 2017). From an applied perspective, these approaches inspect and examine a consumer technology thematic interest from numerous disciplinary fields, taking into account the purposive, normative, pragmatic and/or empirical layers (Jantsch, 1947). Transdisciplinary approaches to co-design require three or more stakeholder types to come together to innovate, demonstrating cooperation and collaboration between academia, industry and government entities, among other stakeholders (Crow & Dabars, 2017). The inspiration for such a derivation has come from the triple helix (Etzkowitz & Leydesdorff, 1995), further developed by numerous scholars with revised or enhanced manifestations in quadruple, quintuple and n-tuple helices demonstrating increasing complex innovation ecosystems (Carayannis & Campbell, 2022; Carayannis et al., 2018; Bartolini et al., 2022).

This approach to considering the implications of consumer technologies and applications also draws inspiration from social-technical approaches to design in the public interest relevant to new features and functions, some of which have unanticipated and unintended consequences (Abbas et al., 2021a; b; c; Abbas & Michael, 2022). By providing solutions-oriented engineering, for example privacy engineering toward the operationalization of a determined value, commensurate responses to the demand for appropriate consent using privacy preserving age verification can be considered, right through to the construction of consumer technology policy sandboxes anticipating adequate governance structures, and even app safeguards and deliberate consideration for members of the public (Gutierrez et al, 2021).

This call for articles intends to build on the Symposium, inviting organizers, presenters, delegates, and virtual registrants to respond to the theme of "*Addressing Complexity in Consumer Technologies and Applications: Transdisciplinary Perspectives*".

TOPICS OF INTEREST:

- Digital privacy in smart cities, smart campuses, communication networks, cloud computing, edge and smart devices, smart systems, digital data, and online applications
- Consumer technologies, vulnerable communities, underrepresented minorities and social and economic implications
- Embedding privacy-by-design, security-by-design, and other value-sensitive/ value-based design approaches in the design of consumer technology and applications
- Technology and risk assessment approaches in the design of consumer technologies
- Identifying privacy risks, and adopting privacy engineering methods toward privacy transformation
- Design justice approaches to consumer technology and application development, incorporating gender, age appropriateness, neurodiversity and more
- Socio-technical, co-design and other design methodologies in consumer technology development
- Age appropriate digital services for children, age gating, terms and conditions, privacy policies, soft law, regulatory responses inclusive of penalties, and the law
- Product testing and engineering of consumer technologies and their evaluation: smart watches, IOT devices, gaming consoles, surveillance devices, drones, etc
- The importance of privacy preserving age verification, anonymity, and digital identity standards
- Data ethics, data privacy, data security, data control
- Metaverse, digital reality, and emerging business models beyond the advertising model
- Public interest technologies, civic technology, public-private partnerships, open data and application initiatives
- Mental health monitoring, anti-gambling, social media addiction awareness applications, behavioural biometrics and human hacking
- Behavioural economics, behavioural engineering, persuasive design, pre-suasion, and post-pandemic behaviours of youth and social media usage
- Smartphone addiction, social media addiction, surveillance, and suicide
- Consumer personally identifiable information (PII), sensitive data, data breach notifications, service level agreements (SLAs) and class action lawsuits
- Digital rights, deceased persons, digital afterlife, digital sovereignty, governance
- Emerging technologies and AI, digital reality, virtual reality, augmented reality and metaverse and their corresponding impact on social media
- Consumer technology and application innovation ecosystems
- Responsible innovation and strategy with respect to consumer technologies, inclusive of trends in trust and human rights
- Futures, reimagining, socio-technical and techno-scientific imaginaries

AUTHOR GUIDELINES:

Submissions must follow IEEE MCE Template available in IEEE Template Selector - <https://template-selector.ieee.org/> - and should consist of the followings: (i) A manuscript of maximum 6-page length (overlength page charges are listed below): A PDF of the complete manuscript layout with figures, tables placed within the text, and (ii) Source files: Text should be provided separately from photos and graphics and may be in LaTeX or Word format. High-resolution original photos and graphics (300 dpi) are required for the final submission. Images embedded in Word or Excel documents are not suitable; however, figures and graphics may be provided in a PowerPoint slide deck, with one figure/graphic per slide.

The authors must own the copyright on any images, photographs or graphics or have obtained explicit permission for use of all such material when a third party owns the copyright. Alternatively, copyleft images and materials may be used once the relevant license terms are complied with, including citations to the original source/author. It is the responsibility of the author(s) to demonstrate such compliance and document the corresponding license agreements (a URL is sufficient) in notes accompanying the submitted article. The authors should include a PDF file with a suggested layout of the article. Figure captions must be provided and ideally figures/graphics should be cited in the text of the article.

An IEEE copyright form will be required. The manuscripts need to be submitted online using the following URL: <http://mc.manuscriptcentral.com/cemag>. This ScholarOne site will automate the generation of a single submission document if the authors have the correct files prepared in advance.

OVERLENGTH PAGE CHARGES:

Articles exceeding 6 pages during author proof will be charged at US\$ 250 per page for extra pages beyond first allowed 6 pages. Similarly, the first allowed pages for column articles is 3 pages, and for news items 2 pages.

IMPORTANT DATES:

- **ARTICLE SUBMISSION DUE:**
March 15, 2023
- **FINAL ACCEPTANCE NOTIFICATION:**
September 30, 2023
- **APPROXIMATE PUBLICATION DATE:**
Q2 2024

GUEST EDITORS:

- Katina Michael (SMIEEE), Arizona State University, USA (katina.michael@asu.edu)
- Roba Abbas (MIEEE), University of Wollongong, Australia (roba@uow.edu.au)
- Wahab Almuhtadi (SMIEEE), Algonquin College/Carleton University, Canada, President IEEE Consumer Technology Society (almuhtadi@ieee.org)
- Elias G. Carayannis, George Washington University, USA (caraye@email.gwu.edu)
- Ibrahim Gedeon, TELUS, CTO, Canada
- Pam Snively, TELUS, Chief Data & Trust Officer, Canada

REFERENCES:

- R. Abbas and K. Michael, "Socio-Technical Theory: A review," In S. Papagiannidis (Ed), TheoryHub Book, 2022, <http://open.ncl.ac.uk>.
- R. Abbas, K. Michael, J. Sargent, and E. Scornavacca, "Anticipating Techno-Economic Fallout: Purpose-Driven Socio-Technical Innovation," *IEEE Trans. on Technology and Society*, vol. 2, no. 3, pp. 111-113, Sept. 2021a, doi: 10.1109/TTS.2021.3098046.
- R. Abbas, S. Hamdoun, J. Abu-Ghazaleh, N. Chhetri, N. Chhetri, and K. Michael, "Co-Designing the Future with Public Interest Technology," *IEEE Technology and Society Magazine*, vol. 40, no. 3, pp. 10-15, Sept. 2021b, doi: 10.1109/MTS.2021.3101825.
- R. Abbas, J. Pitt and K. Michael, "Socio-Technical Design for Public Interest Technology," *IEEE Trans. on Technology and Society*, vol. 2, no. 2, pp. 55-61, 2021c, doi: 10.1109/TTS.2021.3086260.
- S. Bartoloni, E. Calò, L. Marinelli, F. Pascucci, L. Dezi, E. Carayannis, G. M. Revel, and G. L. Gregori, "Towards designing society 5.0 solutions: The new Quintuple Helix - Design Thinking approach to technology," *Technovation*, vol. 113, (102413), 2022, doi: 10.1016/j.technovation.2021.102413.
- M. M. Crow and W. B. Dabars, "Interdisciplinarity and the institutional context of knowledge in the American research university," in R. Frodeman et al. *The Oxford Handbook of Interdisciplinarity*, pp. 471-484, 2017.
- E. G. Carayannis and D. F. J. Campbell, "Towards an Emerging Unified Theory of Helix Architectures (EUTOHA): Focus on the Quintuple Innovation Helix Framework as the Integrative Device," *Triple Helix*, vol. 9, no. 1, pp. 65-75, 2022, doi: 10.1163/21971927-bja10028.
- E. G. Carayannis, E. Grigoroudis, D. F. J. Campbell, D. Meissner, and D. Stamati, "The ecosystem as helix: an exploratory theory-building study of regional co-competitive entrepreneurial ecosystems as Quadruple/Quintuple Helix Innovation Models," *R&D Management*, vol. 48, no. 1, 2018, pp. 148-162.
- E. G. Carayannis, E. Grigoroudis, D. Stamati, and T. Valvi, "Social Business Model Innovation: A Quadruple/Quintuple Helix-Based Social Innovation Ecosystem," *IEEE Trans. on Engineering Management*, vol. 1, pp. 235-248, 2021, doi: 10.1109/TEM.2019.2914408, 68.
- H. Etzkowitz and L. Leydesdorff, "The triple helix - university-industry-government relations: a laboratory for knowledge-based economic development," *EASST Rev*, vol. 14, pp. 14-9, 1995.
- R. Farthing, K. Michael, R. Abbas, and G. Smith-Nunes, "Age Appropriate Digital Services for Young People: Major Reforms," *IEEE Consumer Electronics Magazine*, vol. 10, no. 4, pp. 40-48, 2021, doi: 10.1109/MCE.2021.3053772.
- C. I. Gutierrez, G. E. Marchant, and K. Michael, "Effective and Trustworthy Implementation of AI Soft Law Governance," *IEEE Trans. on Technology and Society*, vol. 2, no. 4, pp. 168-170, 2021, doi: 10.1109/TTS.2021.3121959.
- E. Jantsch, "Inter- and Transdisciplinary University: A Systems Approach to Education and Innovation," *Higher Education Quarterly*, vol. 1, no. 1, pp. 7-37, 1947, doi: 10.1111/j.1468-2273.1947.tb02067.x.