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Computer science and socio-technical systems

Description and Goals

This circle examines the relationship between technology, particularly computing systems, and social systems with an interdisciplinary approach (Baxter & Sommerville, 2011). This includes the design, use, and impact of technology within complex social systems and how these systems shape and are shaped by technology (Mumford, 2006).

Scio-technical systems theory originated in organizational development to explain the interaction of people and technology in workplaces (Trist & Bamforth, 1951). It postulates that both the social aspects (individuals, roles, relationships, culture, etc.) and technical aspects (tools, machines, processes, etc.) are interdependent and must be considered together to ensure a system's effectiveness (Bostrom & Heinen, 1977).

In computer science, socio-technical systems research can involve many activities. Some examples include:

- 1. Designing software systems that better accommodate the social structures and processes of the organizations they serve (Baxter & Sommerville, 2011).
- 2. Studying the societal impact of computing technologies such as artificial intelligence, social media, or digital currencies (Pasquale, 2015).
- Understanding and mitigating technology-related social issues, like the digital divide, cybersecurity threats, privacy concerns, and ethical considerations of AI (Floridi & Taddeo, 2016).
- 4. Analyzing how social factors like collaboration, trust, or user behavior affect the development, deployment, and usage of software systems (Whitworth & de Moor, 2009).

The field of computer science and socio-technical systems draws on methodologies from computer science, social science, organizational studies, and human-computer interaction, among others (Carroll, 2013). This makes it a rich and vibrant field that can offer valuable insights for creating technology that's not just technically advanced but also socially responsible and effective in its intended context (Sommerville, 2018).



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