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This presentation outlines the concerns of a practice-based doctoral investigation into the design of a generative pictographic system for cognitively accessible communication. The project is centred on adults with complex communication needs (CCN) and asks how such a system can support intuitive, culturally meaningful expression while promoting self-determination.

Rather than viewing artificial intelligence as a black-box backend, the research presents AI as a design material—something to be shaped through visual grammar, interaction logic, and participatory input. The project progresses along two interconnected tracks: a formal modelling strand aimed at creating a generative pipeline from semantic prompts to pictogram outputs, and a situated inquiry strand that relies on interviews with AAC professionals and designers to anchor the system in real-world communicative practices.

Drawing on recent work in design ethics and AI mediation (Gray & Chivukula, 2019), the project argues that cognitive accessibility should be prioritised as a primary design condition, shaping systems from the outset rather than retrofitting them for usability (Bühler, 2021). The project envisions a federated architecture as a future stage, enabling users to locally adapt the system while contributing to a shared knowledge base, addressing the universal-local paradox that underlies much of AAC design (Chan et al., 2020).

Methodologically, the work combines visual prototyping, co-design, and speculative interface modelling, supported by principles from cognitive psychology, linguistic philosophy, and AI ethics.

The proposed system—PictoNet—utilises a modular visual grammar based on semantic primitives and envisions a federated architecture that permits local adaptations to be integrated into a collective pictographic commons.

By considering cognitive accessibility as a fundamental aspect of design rather than an afterthought, the project aims to develop a visual language infrastructure that is expressive, adaptable, and rooted in user participation.

#### **Keywords**

AAC, cognitive accessibility, pictograms, practice-based research, semantic primitives

#### **References**

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