Clinically-aligned AI for diagnosis in dermatology

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Introduction: While artificial intelligence (AI) is expected to impact clinical decision making, studies show that adopting AI tools for decision support often does not improve decision outcomes. We claim this is due to researchers and developers taking a *technology-first* approach to decision support that seeks to exploit what technology can do, rather than a *cognition-first* (or *clinical-first*) approach that supports what clinicians need.

Aims: This study aims to identify the key requirements for AI-based decision aids for supporting dermatologists to identify malignant skin lesions. We take a cognition-first approach that identifies key aspects required for successful diagnosis of malignant skin lesions, and aims to support this cognitive process.

Methods: Using co-design workshops with dermatologists with varying levels of experience, we identified key aspects required for effective diagnosis of malignant skin lesions. Taking findings from these co-design workshops, we combined an existing model of sensemaking with state-of-the-art approaches to computer vision to design two novel AI diagnosis tools.

Results: Clinicians valued that the tool supported collaborative thinking, was cognisant of common clinical decision-making approaches, and used explainable AI to help clinicians rationalise why the tool considered a feature as important, yet identified secondary risks of this 'collaborative' approach, such as 'gaming the system'.

Conclusions and Relevance: In our next step, we are now running a larger-scale controlled study involving clinicians from the International Dermatology Society, and to take the basic approach and apply this to other areas for supporting clinicians in medical imaging.

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