hikm

Health Informatics Knowledge Management Conference 2025

Empowering Health: AI Innovations

16-17 September 2025

The recent astonishing advances in AI and technologies have raised serious concerns about how Healthcare, Health Information, Knowledge Management, and our society in general will be affected. Interoperability remains a big concern as well, which has thus far, placed severe limitations on the adoption of technology into clinical practice. At our #HIKM2025 Conference, we will explore, review and assess these changes and their effects on clinical decisions, trust, openness and the sustainability of healthcare and society.

Conference Program

HIKM 2025 is fully online and free to attend! Get your event invitation at hikm.org/hikm-2025/#Register

Day One: Tuesday, 16 September 2025

AEDT	Topic
11:00	**Welcome** **Conference Opening**
11:10	**Using Machine Learning Explainer SHAP to Improve Genomic Data Heatmap Visualisation on a Dashboard** *Zhonglin Qu, Rani Adam, Daniel Catchpoole, Simeon Simoff and Vinh Quang Nguyen (Full Paper)* **Trends, Transitions, and Workforce Intentions in Health IT** *Salma Arabi, Kerryn Butler-Henderson, Wei Wang and Kay Nicol (Full Paper)* **Enhancing Drug-Drug Interaction Prediction with Functional Group-Weighted Graph Neural Networks** *Fangyu Zhou and Shahadat Uddin (Full Paper)* **Extending Diabetes CDSS to Offloading Footwear Prescription: A Conceptual Adaptive Semantic Framework** Kunal Kumar, Ashad Kabir, Luke Donnan and Sayed Ahmed (Full Paper) Session Chair: Pari Delir Haghighi – Monash University, Australia
12:25	**Short Break**
12:30	**KEYNOTE 1: AI-Powered Healthcare** ***Dr. Sankalp Khanna*** *- Team Leader, Health Intelligence, CSIRO Health & Biosecurity* Session Chair: Quang Vinh Nguyen
13:30	**Generating a knowledge graph to understand the mechanistic relationships between multimorbid diabetes, hypertension and kidney diseases** *Emmanuel Egwuatu, Ali Daowd, Samina Abidi and Syed Sibte Raza Abidi (Full Paper)* **Introducing Digital Twin Capability Building in Healthcare through AI Powered Projects** *Sitalakshmi Venkatraman, Kiran Fahd, Xiaodong Wong, Sazia Parvin and John Minicz (Full Paper)* **Suburban community characteristics and pandemic spread: Australian retrospectives and machine learning-based insights** *Fangyu Zhou, Tasadduq Imam, Shahadat Uddin and Shakir Karim (Full Paper)* Session Chair: Bhavna Antony - Federation University, Australia

AEDT	Topic
14:30	**The Prof is IN!** *Ask any question, share any news, suggest any ideas or make any comments!* Moderator: Andrew Stranieri
15:00	**TUTORIAL 1: AI for Patient Safety: Enhancing the Health System's Response to and Learning from Patient Harm** ***Dr. Ying Wang and Prof. Farah Magrabi -*** *Australian Institute of Health Innovation, Macquarie University, Australia* Up to 1 in 14 patients experience preventable harm, costing health systems over USD 600 billion annually. This tutorial introduces how AI, especially large language models (LLMs), can accelerate learning from patient safety incident data. Drawing on research from Professor Farah Magrabi's team, we demonstrate how to adapt LLMs via pretraining, fine-tuning, and retrieval-augmented generation (RAG) for incident analysis, classification, and trend detection. Participants will learn strategies for model selection, data preparation, and applying these methods to large-scale incident management systems, with case studies from patient safety and insights on scaling these methods to other domains. Session Chair: Andrew Stranieri - Federation University, Australia
17:00	**Recognizing Early Signs and Symptoms of Alzheimer's Disease for Improved Digital Diagnostics: Semi-structured interviews and observational metrics** *Chathurika Palliya Guruge, Pari Delir Haghighi, Sharon Oviatt, Helene Roberts and Elizabeth Pritchard (Full Paper)* **Exploring patient safety functions of Australian health information management professionals from the Australian Specialist Digital Health Workforce Censuses** *Trixie Kemp, Salma Arabi, Kerryn Butler-Henderson and Jennifer Ayton (Full Paper)* **Do Visual Details Matter? The Effect of Different Representations of Avatar Performance in an Immersive Rowing Exergame on User Performance and Motivation** *Packy Li, Huiwen Lu, Guanzhuo Li, Jiayi Yin, Jingyi Yang, Zixuan Wang, Dominik Lange-Nawka, Elliott Wen and Burkhard Wuensche (Full Paper)* Session Chair: Georg Grossman - University of South Australia
18:00	**A Systematic Literature Review of Cybersecurity Approaches to Healthcare Worldwide** *Azadeh Khodadadi, Armita Zarnegar, Wendy Burke (Poster)* **Towards better event log preparation with quality optimisation for hospital process mining** *Ruihua Guo, Angus Richie, Yang Lu, Boris Choy, Ross Smith, Haeri Min, Qifan Chen and Simon K. Poon (Poster)* **Treatment Dashboard- a visual representation of patients' treatment regimens** *Vishakha Sharma, Andrew Stranieri, Frada Burstein, Sally Firmin (Poster)* **Preserving Identity and Enhancing Emotional Well-Being: An AI-Powered Conversational Assistant for Dementia Care** *Kiran Fahd, Sitalakshmi Venkatraman, John Minicz (Poster)* **Multi-Task Learning Approaches for Predicting ADMET Properties: A Review** *Nadezhda Diadkina (Poster)* Session Chair: Zhonglin Qu – Western Sydney University
18:30	**An Evaluation on Kinematics During Different Lifting Tasks with Marker-less Vision-based Cameras** *Feridun Talat, Jim Basilakis and Quang Vinh Nguyen (Full Paper)* **Concept-Level Local Explanations of Kidney Transplant Survival Predictions by Black-Box ML Models** *Jaber Rad, Syed Asil Ali Naqvi, Karthik Tennankore, Samina Abidi, Amanda Vinson and Syed Sibte Raza Abidi (Full Paper)* **Unifying Medical Large Language Models and Knowledge Graphs: BioBERT, ICD-10 and the UK Biobank** *Giles Oatley, Tanveer Choudhury and Fergal Grace (Short Paper)* Session Chair: Burkhard Wuensche – University of Auckland
19:30	**Close of Day One**

Day Two: Wednesday, 17 September 2025

AEDT	Topic
11:00	**Opening of Day Two**
11:05	**Propensity Score Estimation for Causal Inference in Observational Healthcare Studies** *Nabila Ramadhanti, Suryani Lim, Michal Chorev, Madhu Chetty and Fadi Charchar (Full Paper)* **TUG-IoT: A Mobile Integrated IoT based Timed Up and Go Test** Moomal Farhad, Ronan Edge, Jacqueline Forster, Duhncan Guy, Erica Mayo, Bhavna Antony and Tanveer Choudhury (Short Paper) **Semantic Encoding in Medical LLMs for Vocabulary Standardisation** *Samuel Mainwood, Aashish Bhandari and Sonika Tyagi (Full Paper)* **Hierarchical Global-To-Local Feature Selection Architecture for HDLSS Datasets: A Computational Framework for Personalized Medicine in Oncology** *Mostafa Mohiuddin Jalal, Paul Kennedy and Daniel Robin Catchpoole (Full Paper)* Session Chair: Klaus Veil - Western Sydney University
12:25	**Short Break**
12:30	**KEYNOTE 2: Generative AI in Healthcare - A Socio-Technical Challenge for Computer Scientists** ***Prof. Ping Yu*** *- School of Computing and Information Technology, University of Wollongong, Australia* Designing systems that are not only powerful, but also safe, explainable, and clinically meaningful Session Chair: Zhonglin Qu - Western Sydney University
13:30	**An Auto-Ethnographical Analysis of Translational Digital Health Research** *Andrew Stranieri (Full Paper)* **Exploring Physicians' Information-Seeking Behavior in the AI Era: A Survey on LLM and Knowledge Graph Perceptions** *Riki Bharali, Hamzah Bin Osop, Zechan Wang and Monica Lawrence (Full Paper)* **Roles and Functions of the health informatics and health information technology workforce in Australia** *Kerryn Butler-Henderson, Salma Arabi, Kay Nicol and Wei Wang (Short Paper)* **Bridging the Gap: Leveraging Retrieval-Augmented Generation to Better Understand Public Concerns about Vaccines** *Muhammad Javed, Sedigheh Khademi Habibabadbi, Christopher Palmer, Hazel Clothier, Jim Buttery and Gerardo Luis Dimaguila (Short Paper)* Session Chair: Jadumani Singh - JR Analytics
14:40	**The Prof is IN!** *Ask any question, share any news, suggest any ideas or make any comments!* Moderator: Klaus Veil - Western Sydney University
15:00	**TUTORIAL 2: Visual Analytics and Trust of Omics Data** ***A/Prof. Quang Vinh Nguyen and Dr Zhonglin (Jolin) Qu -*** *Western Sydney University* Omics data represent a big data problem that needs accurate visual data processing and analytics. Visual analytics of omics data could support the diagnostics and allow clinicians to tailor the treatment to the most efficacious for individuals. This tutorial serves at a practical guide that provides theoretical knowledge and illustrated applications to support big omics and data visual analytics. The materials reflect the visual analytics advancement in various health domains, such as genomics and flow cytometry analytics. To align human trust with the AI model's actual capabilities, we interactively visualise the AI results and explain the Random Forest model with the SHAP explainer in clinical feature analysis. The tutorial is designed for participants who would like to learn or explore the important state-of-the-art technologies, methods and the underlined theories to support big omics data visual analytics. Session Chair: Andrew Stranieri - Federation University, Australia

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16:30	**Training the trainers: building the digital health capability in the academic workforce through DHALI** *Buck Reed, Salma Arabi, Kerryn Butler-Henderson, Jodie Brabin, Aathira Suvi and Judith Crockett (Full Paper)* ***Can Artificial Intelligence Predict Glycaemic Responses to Food from Food Photographs Using a Mobile App?*** *Pari Delir Haghighi, Shunhao Li, Yuxin Zhang, Frada Burstein, Thanh-Toan Do, Daphne Flynn and Christopher Gilfillan (Full Paper)* **Sound Parameters for VR Masking Sound Treatment for Tinnitus** *Blair Mclean, David Huckle, Burkhard Wuensche and Philip J. Sanders (Full Paper)* Session Chair: Georg Grossman - University of South Australia
17:30	**Toward Non-Invasive Smart Healthcare: Assessing Elderly Motor Function Using Vision-Based Center of Gravity Estimation** *Zhaozhen Tong, Sinan Chen, Yuko Yamaguchi, Kumiko Ono, Masahide Nakamura (Poster)* **Development and evaluation of a machine learning algorithm for predicting pressure injury risk during hospitalisation** *Nanthakumahrie Gunasegaran, Maybelle Auw, AxoMem Singapore, Sean Whiteley, Fazila Aloweni (Poster)* **Cybersecurity for Medical IoT in Connected Healthcare Ecosystems: Risk Mitigation Strategies** *Dmitri Kharchevnikov (Poster)* **V-CARE: VR Cognitive Assistance and Recommendation Engine** *Zhengyang Feng, Jayan Chirayath Kurian, Mukesh Prasad, Nimish Biloria, Priya Saravanakumar (Poster)* **Augmented Reality for Immersive Clinical Data Visualization: Insights from Medical Students and Early Translational Researchers** *Neha Sundar Naik, Zhonglin Qu, Quang Vinh Nguyen, Simeon Simoff, Paul. J Kennedy, Daniel Catchpoole (Poster)* **Continuous Vital Signs Monitoring Outside Intensive Care Requires New Charts** *Teena Arora, Preeti Shenthikumar, Venki Balasubramanian, Andrew Stranieri, Ramanan Rajagopal, AP Suresh Kumar, Suchetha M, Poonkodi M (Poster)* *Session Chair: Zhonglin Qu - Western Sydney University*
18:00	**Addressing Bias and Ensuring Fairness in AI Systems for Healthcare** *Armita Zarnegar (Full Paper)* **AI in Primary Care: Insights from Family Physicians** *Diana Callebaut and António Trigo (Short Paper)* **Feasibility of Using LLMs to Automate Analysis of AI/ML Medical Device Approvals** *Ying Wang, Diogo Monteiro do Amaral and Farah Magrabi (Short Paper)* **Innovating Health- and Aged-Care - are Art-based Technologies the next Step?** *Sharron T, Klaus Veil, and Gregor Poole (Short Paper)* Session Chair: Burkhard Wuensche – University of Auckland
19:05	**Conference Close**

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Conference Proceedings

Keynotes & Tutorials

KEYNOTE 1: AI-Powered Healthcare

Dr Sankalp Khanna - *CSIRO Health & Biosecurity*

Pressure continues to mount on hospital systems worldwide due to ageing populations and the growing burden of chronic diseases and skills shortages. Despite words like "boom", "bubble", and "buzz" being used to describe the growing uptake of AI, health care continues to lag other industries in seeing sustained adoption of AI-powered solutions.

This keynote discusses some of the challenges impeding AI adoption in healthcare, and the planning, development and delivery of AI-powered solutions in the Australian health landscape by the Commonwealth Scientific and Industrial Research Organisation (CSIRO), Australia's national science agency. While describing innovation in the space of AI-powered decision support in health, the focus is on sharing the valuable lessons learnt with researchers already working on, or starting to explore this exciting area.

Dr. Sankalp Khanna is a Senior Principal Research Scientist and leads the Health Intelligence team at the CSIRO Australian e-Health Research Centre. His research is focussed on applying Artificial Intelligence and Machine Learning techniques to model, analyse, predict, simulate and optimise patient flow through Australian public hospitals; and develop explainable algorithms for delivering decision support that clinicians can interpret and trust. Solutions developed by Sankalp have helped reshape workflow and policy in hospitals in Australia and overseas. Sankalp has served as Adjunct Associate Professor at the Queensland University of Technology and Griffith University. He is a member and Treasurer of the Pacific Rim International Conference on Artificial Intelligence (PRICAI) Steering Committee, and a founding Fellow of the Australasian Institute of Digital Health.

KEYNOTE 2: Generative AI in Healthcare - A Socio-Technical Challenge for Computer Scientists

Prof. Ping Yu - *School of Computing and Information Technology, University of Wollongong, Australia*

Generative AI and large language models (LLMs) are advancing rapidly; however, their integration into healthcare requires more than just algorithmic progress. Unlike other domains, healthcare requires systems that clinicians can trust, regulators can explain, and patients can use with confidence. This keynote frames the challenge as a socio-technical one, where collaboration between computer scientists and clinicians is central to success. Retrieval-augmented generation (RAG) offers a practical path forward: by grounding outputs in curated clinical knowledge, it adapts to evolving models while improving transparency and explainability.

This keynote will explore how RAG can be optimised for efficiency, multimodal integration, and reduced risks of hallucination and bias. Just as importantly, it will emphasise collaboration between computer scientists and clinicians to ensure AI fits within real clinical workflows. The aim is to move beyond technical novelty toward generative AI systems that are powerful, explainable, and clinically meaningful; tools that support, rather than replace, clinical expertise.

Professor Ping Yu is a multi-award-winning researcher and internationally recognised leader in digital health innovation. For over two decades, she has driven transformative, industry-engaged research that has advanced the digital modernisation of health and aged care in Australia and internationally. Applying a socio-technical approach, her work has shaped the design, adoption, and evaluation of digital technologies, improving clinical practice, organisational efficiency, and patient outcomes.

Her current research centres on generative AI in healthcare, building on expertise in knowledge engineering and socio-technical systems and pioneering retrieval-augmented generation (RAG) tools to extract insights from clinical text to support intelligent risk prediction, and transform clinical practice and patient education.

TUTORIAL 1: AI for Patient Safety - Enhancing the Health System's Response to and Learning from Patient Harm

Dr. Ying Wang & Prof. Farah Magrabi *– Australian Institute of Health Innovation, Macquarie University, Australia*

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