



PolyU Design

# PhD

THESIS SERIES

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An Agent-based Framework to Support Collaborative  
Product Design

2007

# PhD

1999–2020 THESIS SHOWCASE

Collaborative design creates added value in the product development process by combining the benefits of teamwork and cooperation in a concurrent manner. However, the effectiveness and success of collaborative design are undermined by the difficulties arising from the differences between heterogeneous system architectures and information structures. This thesis investigates the requirements of collaborative product design and proposes a new agent-based framework to support collaborative product development by improving the efficiency and effectiveness of the management and coordination of collaborative product design processes. Based on the investigation of a collaborative design process, a new framework for collaborative design is proposed. It adopts an agent-based approach and relocates designers, systems, and supporting agents in a unified knowledge representation scheme for collaborative product design. A prototype system is implemented, and design experiments are carried out with the prototype system to validate the feasibility and applicability of the system. These design experiments demonstrate how the proposed framework improves the efficiency and effectiveness of the management and coordination of a collaborative product design process.

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