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ASPECT DRIVEN DESIGN FOR RECONFIGURABLE SYSTEMS

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ABSTRACT: This talk describes a novel design approach targeting reconfigurable systems. This approach is based on aspect-oriented programming to decouple design development from design optimisation, thus improving design portability and developer productivity while enabling automated exploration of design trade-offs to enhance performance. We introduce FAST, a language for specifying dataflow designs that supports our approach. Optimisation strategies for the generated designs can be specified in FAST, making use of facilities in the domain-specific aspect-oriented language, LARA. Our approach is demonstrated by implementing various applications, including seismic imaging designs for Reverse Time Migration (RTM), which have performance comparable to state-of-the-art FPGA implementations while being produced with improved developer productivity.

BIOGRAPHY: Wayne Luk is Professor of Computer Engineering at Imperial College London. He founded and leads the Programming Languages and Systems Section and the Custom Computing Research Group in Department of Computing, and was Visiting Professor at Stanford University and Queen's University Belfast. His research interests include reconfigurable computing, field-programmable technology, and design automation. Many of his papers received awards at conferences such as ASAP, FPL and FPT, and he also won a Research Excellence Award from Imperial College London. He is a Fellow of the Royal Academy of Engineering, the IEEE and the BCS.

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