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## Model-driven architecture for software and hardware designs

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In this research, we designed and developed a model-driven architecture methodology to be utilized in software and hardware designs.  Model-driven architecture is a software approach commonly used for software design development. Model-driven architecture captures a design at the modeling level and transforms it through computation-independent model (CIM), platform-independent model (PIM), and platform-specific model (PSM) into realized designs.  Our work includes the definition of models at various levels in schemas and design tasks of model expansion, model synthesis, and model transformation utilized in the design development process.  A model's composition can be specified as a composition graph of submodels and components.  The composition rules can be specified in a model composition graph schema for model expansion uses.  From CIM to PIM, specific design techniques can be selected and expanded into design details in refined models.  From PIM to PSM, platform-specific design decisions can be made for realization choices.  Designs in PSM can then be transformed into final realization languages such as C++, Verilog, etc.  In this research, we utilized the developed MDA technology in various research works such as optimization framework design, interconnection network design, etc.  From the utilization experience, we validated that MDA is a viable approach for assisting designers to produce their designs from high level to the realization level and for facilitating them to pay attention to critical design decisions.

### Biography

Tsung Lee completed his PhD in Computer Science from UCLA in 1992. He joined the Department of Electrical Engineering, National Sun Yat-sen University, Kao-Hsiung, Taiwan, R.O.C., and is Associate Professor presently. His current research interest includes software design methods and system software and is a member of IEEE.

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