Intelligent Industrial Information Technologies

Prof. Heinz W. Schmidt
Platform Technologies Research Institute

- Overview
- Projects
- Opportunities
Overview: Project Themes & Nexus

I3T Themes

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<th>Platforms Institute</th>
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Design Institute
Overview: Project Themes & Nexus

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Platforms Institute
I3T Initial Projects
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- Control
- Intelligence

Design Institute

Business College
I3T Overview: Key info

- **CIs**: Heinz Schmidt (Program Leader), Lin Padgham, Xinghuo Yu, Liuping Wang
- **AIs**: Bil, Deng, Hill, Li, Trivailo, Wu
- **Postdocs**: Feng, Peake, Peng

- **Budget**: $300K (three postdocs + some overheads)
- **Effective runtime**: approx. 1y
- **AMCRC**: ~$1M start 1/09
Projects

• Industrial Control Systems
• Computer Systems and Software Architecture
• Human-Centered Intelligent Decision Support
Projects

• Industrial Control Systems
• Computer Systems and Software Architecture
• Human-Centered Intelligent Decision Support
Industrial Control Systems

• Intelligent systems and controls
• Dynamic information
• Simplicity and effectiveness for industry users

• AMCRC with ANCA P/L
  – Parameter Estimation
  – Auto-tuning
Parameter Estimation

• Inertia of wheel pack during production may affect control parameters of precision control CNC machine

• Aim at accurate inertia estimation and implementation of auto-adjustment using
  – recursive estimation algorithm utilising extensive ramp-up data collection
  – prototyping of control algorithms in MATLAB
Auto-tuning

• Generic control algorithms for self-tuning servo drives
  – maintain control targets without human intervention
  – while dynamic changes occur during machine operation
  – build on results of parameter estimation project
  – present 3D virtual reality modelling and simulation interface for engineers
Projects

• Industrial Control Systems

• Computer Systems and Software Architecture

• Human-Centered Intelligent Decision Support
Computer Systems and Software Architecture

• Architectural design and integration platform
• Timing, reliability and cost prediction in early development stages using component-based architectures & formal models
• Model-driven testing and performance benchmarking
Projects

• Industrial Control Systems
• Computer Systems and Software Architecture
• Human-Centered Intelligent Decision Support
Human-Centered Intelligent Decision Support

• Innovative intelligent decision support
• Performance improvements
• Human-centered thinking machine systems
Opportunities

- I3T attracting potential partners from wide range of industrial sectors and government agencies
- CSIRO, NICTA, SP AusNet, Jemena, Powercor, First Databank, Deloitte, ABB
- Areas of interest:
  - **Health/Med:** adverse drug interaction detection, programming smart materials in prosthetics
  - **Energy:** Smart grid and renewable energy application; grid- and cloud-enabled simulation
  - **Utilities:** Intelligent metering application

*Let’s meet and talk for more details...*