Developing Support Tools for Distributed Cognition Analysis

Relevance With My Post-doctoral Career Training

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Background: My Early Career in IT

Started as Linux system admin, trainer and tech-writer (2000-2004)

During my undergraduate study at Bangladesh University of Engineering & Technology (BUET), I was:

- System Administrator (Part-time)
  → EasySoft Networks Ltd. Dhaka.
- Tutor/Network Engineer (Part-time)
  → Institute of Info & Comm. Tech., BUET
- Associate Editor (Part-Time)
  → Technology Today Ltd. Dhaka.
- Systems Engineer (Part-Time)
  → Ektoo Ltd. Dhaka.

Figure: Some Linux distributions I used since 1999

From part-time to full-time IT Professional

Early inspirations for Software Prototyping (2004-2005)

- As a *project engineer* in computerization of a large gas distribution company
  $\longrightarrow$ worked both at Institute of Information & Communication Technology, BUET and Gas Distribution company's office
- Completed a full range of software engineering tasks:
  $\longrightarrow$ from requirement specification, system design, database development, data entry and testing
- gained a broad range of experiences
  $\longrightarrow$ in designing/developing data entry system, database, unit test and deployment

From IT to Robotics and Human Computer Interaction

2005-2007 at Korea Institute of Science & Technology (KIST)

- As a *post-graduate research assistant* at Center for Cognitive Robotics Research
  → initial research on humanoid service security, real-time humanoid control.
- Studied graduate level courses at KIST and Korea University
  → e.g. Human Machine Interaction, Intelligent Control, AI Techniques
- Masters thesis on knowledge-based service for human-centred robots
  → became a AI-based robot programmer
- After Masters course I became *visiting research scientist* at KIST!

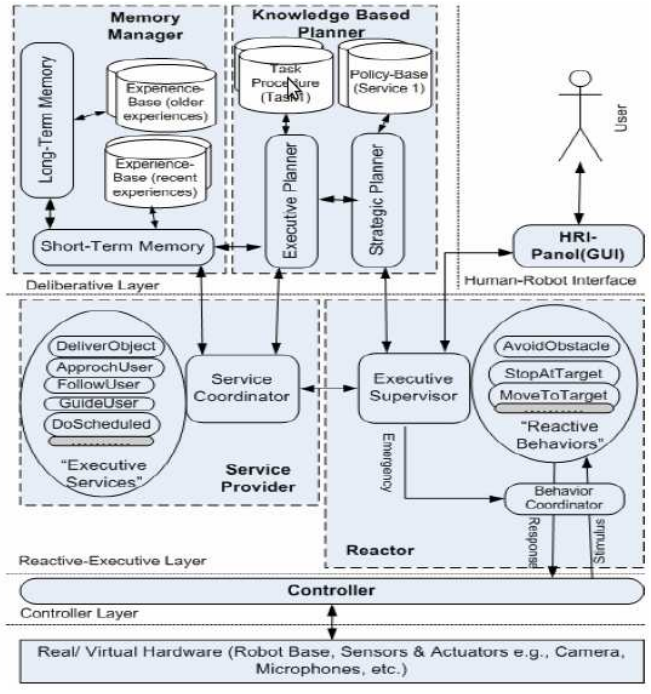

Figure: Knowledge-Based Human-centered architecture
(Sarker et al. 2007, Proc. of 16th IEEE International Symposium on Robot and Human interactive Communication (RO-MAN 2007), Jeju Island, South Korea)

From humanoid Robot to Distributed Multi Robot System

Self-organized Multi-robot Task Allocation

- As a part of the EPSRC collaborative research project involving human social, biological and artificial social systems
  $\longrightarrow$ deriving local control rules for system-wide self-organized division of labour
- A series of software development/integration tasks
  $\longrightarrow$ involving applied computer vision, distributed mobile robotics, wireless networking, systems engineering
- Gained a broad range of experiences
  $\longrightarrow$ in developing distributed software system, multi-robot tracking and source code management

Google-Summer-of-Code: Joined in Open Source Coding

- 2009 with BlueZ: Bluetooth system programming
- 2010 with Tahoe-LAFS: A decentralized introduction scheme
  $\longrightarrow$ for peer-to-peer secure file sharing
- Contributed thousands of lines code in C/C++, Python
  $\longrightarrow$ learned test-driven development, source code version management

Multi-robot Control Framework Developed at Newport

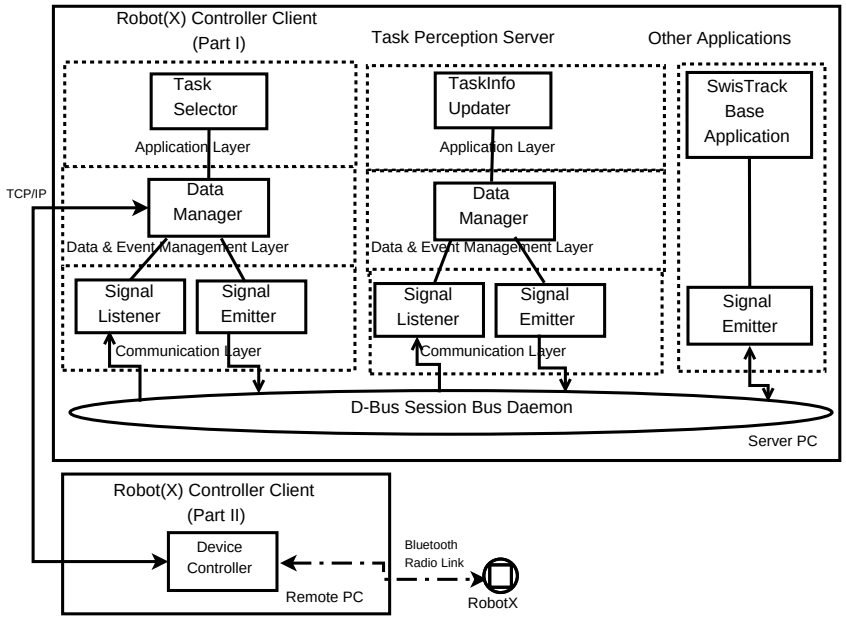

Figure: Hybrid event-driven architecture on D-Bus (Sarker & Dahl. UKACC Int'l Conference on Control, CONTROL 2010.)

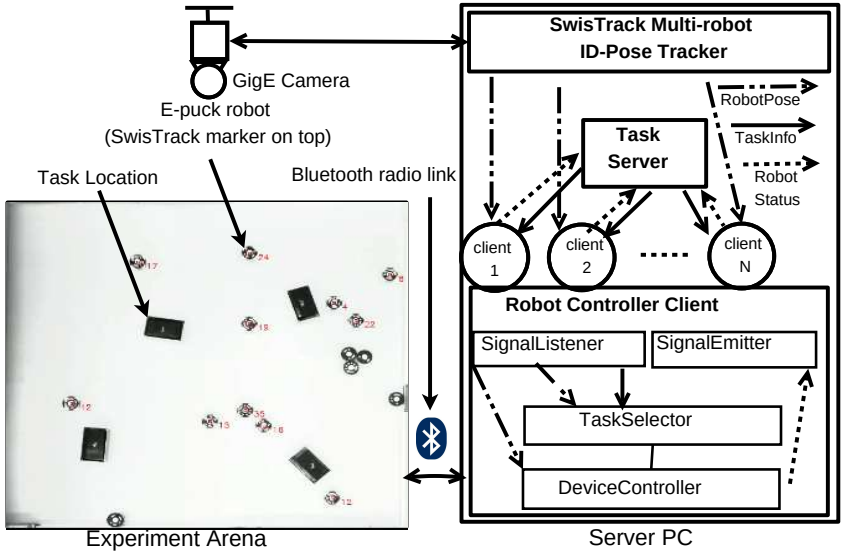

Figure: Hardware and software implementation (Sarker & Dahl. Swarm Intelligence, *LNCS* 6234, 2010.)

Towards Becoming a Faculty and Professional Scientist

Research Systems Development: An Opportunities to learn more and to develop new skills

- Software engineering
  $\longrightarrow$ independent full-cycle real-world application development
- Statistical data analysis
  $\longrightarrow$ data modelling, analysis, data-to-decision
- Research output
  $\longrightarrow$ conference and journal articles and more
- Collaborative knowledge-sharing
  $\longrightarrow$ communication and interaction with industry and academia