

TUTORIAL I

Role-Based Collaboration

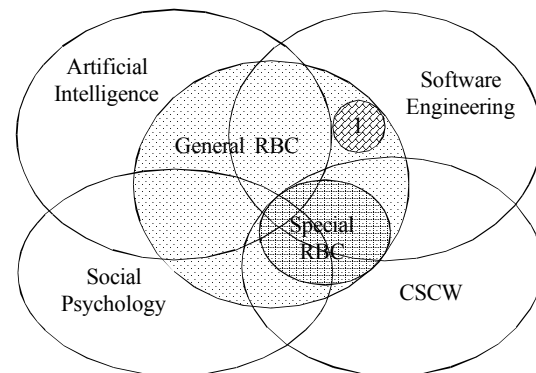
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TUTORIAL DESCRIPTION

RBC is a computational thinking methodology. It is an emerging technology that mainly uses roles as underlying mechanisms to facilitate abstraction, classification, separation of concern, dynamics, and interactions. RBC will find wide applications in different fields, such as, organizations, management systems, systems engineering, and industrial engineering. It is generally relevant to many research and engineering fields including Software engineering, Computer Security, Collaborative Intelligent Systems and Social Psychology (Fig. 1). The goal of special RBC is to improve collaboration among people based on computers. CSCW (Computer-Supported Collaborative Work) systems are computer-based tools that support collaborative activities and should meet the requirements of normal collaboration. They should not only support virtual face-to-face collaborative environment but also improve face-to-face collaboration by providing more mechanisms to overcome the drawbacks of face-to-face collaboration. The extended goal of general RBC is to improve collaborations among objects including humans, systems, and system components. Roles can be used to improve the collaboration methodologies, upgrade the management efficiencies, keep the consistencies of systems, and regulate the behaviors of system components and systems.



1: RBAC

Fig. 1 RBC and other relevant Area

This tutorial will first review the current situation of CSCW research and the applications of role concepts. It will then explain the reasons of proposing role-based collaboration. Then, a

synthetic view of roles in collaboration will be proposed. Based on the role concept, the general process of role-based collaboration is demonstrated. To support role-based collaboration efficiently, the architecture of role based collaborative systems and the system model E-CARGO are described. To demonstrate the application of RBC, two case studies of RBC applications are presented: role-based multi-agent systems and role-based software development. Lastly, potential applications of RBC and challenges that need further research are predicted.

TUTORIAL OUTLINE

We cover the following topics:

- What do we mean by roles in collaboration?
- What is role-based collaboration (RBC)?
- Why do we need RBC?
- How can we support RBC?
- What are the emerged and potential applications of RBC?
- What are the emerged and potential benefits?
- What are the challenges and difficulties?

REFERENCES

1. Zhu, H. and Zhou, M.C., "Role Mechanisms in Information Systems: A Survey", *IEEE Trans. on Systems, Man and Cybernetics, Part C*, vol. 38, no. 3, May 2008, 20 pages (in Press).
2. Zhu, H. and Zhou, M.C., "Role-Based Multi-Agent Systems", *Rafael Andres Gonzalez Rivera, Nong Chen and Ajantha Dahanayake and (Eds.), Personalized Information Retrieval and Access: Concept, Methods and Practices*, IDEA GROUP INC., Hershey, PA, USA, March 2008, Chapter XII (31 pages).
3. Zhu, H., "Fundamental Issues in the Design of a Role Engine", *Proc. of the 2008 International Symposium on Collaborative Technologies and Systems (CTS 2008)*, May 19-23, 2008, Irvine, California, USA.
4. Zhu, H., "Role as Dynamics of Agents in Multi-Agent Systems", *System and Informatics Science Notes*, vol. 1, no. 2, July 2007, pp. 165-171.
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6. Zhu, H. and Zhou, M.C., "Role-Based Collaborations and their Kernel Mechanisms", *IEEE Trans. on Systems, Man and Cybernetics, Part C*, vol. 36, no. 4, July 2006, pp. 578-589.
7. Zhu, H. and Zhou, M.C., "The Role Transferability in Emergency Management Systems", *Proc. of the 3rd International Conference on Information Systems for Crisis Response and Management (ISCRAM'06)*, Newark, NJ, USA, May 14-17, 2006, pp. 487-496.
8. Zhu, H., "Role Mechanisms in Collaborative Systems", *International Journal of Production Research*, vol. 44, no. 1, Jan. 2006, pp. 181-193.
9. Zhu, H., "A Role Agent Model for Collaborative Systems", *Proceedings of the 2003 International Conference on Information and Knowledge Engineering (IKE'03)*, Las Vegas, Nevada, USA, June, 2003, pp. 438-444.

And over 100 related references will be cited in this tutorial.

REQUIREMENTS AND TARGET AUDIENCE

The target audience includes researchers, practitioners and graduate (PhD or Master) students who are interested in collaboration technologies.

TUTORIAL DURATION

The tutorial material will be presented in approximately 3-hour session.

INSTRUCTOR BIOGRAPHY

Haibin Zhu is an associate professor of the Department of Computer Science and Mathematics, Nipissing University, Canada. He received B.S. degree in computer engineering from Institute of Engineering and Technology, China (1983), and M.S. (1988) and Ph.D. (1997) degrees in computer science from the National University of Defense Technology (NUDT), China. He was a visiting professor and a special lecturer in the College of Computing Sciences, New Jersey Institute of Technology, USA (1999-2002) and a lecturer, an associate professor and a full professor at NUDT (1988-2000). He has published about seventy research papers, five books (four in Chinese and one in English) and one book chapter on object-oriented programming, distributed and collaborative systems, computer architecture and intelligent systems.

Dr. Zhu pioneered the research on role-based collaboration (RBC) in 2002. His research has been sponsored by IBM Eclipse Innovation Grants and National Science and Engineering Research Council (NSERC) of Canada. He has published more than 20 papers related to this topic since 2003 (please see the attached publications). He has been invited to give many presentations on RBC in universities and research institutions. He offered a half-day tutorial of RBC for CODS'07. He also gave a one-hour seminar on RBC for the workshop on RBC of CSCW'06. Due to his research on collaboration, he was appointed as co-chair for the technical committee of Distributed Intelligent Systems of the IEEE SMC society in 2006.

He served and is serving as co-chair of the technical committee of Distributed Intelligent Systems of IEEE SMC Society, editor for the Int'l Journal of Intelligent Control and Systems, member of the International Domain Experts Board (IDEB) of the International Journal of Patterns, guest editor for the special issue of "Collaboration Support Systems" for IEEE Trans. on SMC(A), guest associate editor for the CIT 2005 special issue for the Int'l Journal of Pervasive Computing and Communications, program vice chair for the 2007 SIWN International Conf. on Complex Open Distributed Systems (CODS 2007), Chengdu, China, 22-24 July 2007, publicity chair for the 2007 Int'l Symposium on Collaborative Technologies and Systems (CTS 2007), May 21-25, 2007, Orlando, FL, USA, organizer for the workshop on "Role-Based Collaboration" of the 2006 ACM Int'l Conf. on Computer-Supported Cooperative Work (CSCW 2006), and organizer for 7 special sessions for the IEEE International Conference on Systems, Man and Cybernetics (2003-2007) and the IEEE International Workshop on Distributed Intelligent Systems (2006), program committee member for more than 10 international academic conferences.

Dr. Zhu is the receipt of the CTS 2007 Service award, the 2006-2007 Nipissing University research award, the 2004 and 2005 IBM Eclipse Innovation Grant Awards, the Best Paper Award from the 11th ISPE Int'l Conf. on Concurrent Engineering (ISPE/CE2004), the Educator's Fellowship of OOPSLA'03, a 2nd Class Nation-Level Award of Excellent Textbook from the Ministry of Education of China (2002), a 2nd Class Nation-Level Award of Education Achievement from Ministry of Education of China (1997), three 1st Class Ministry-level Research Achievement Awards from DOD of China (1997, 1994, and 1991), and a 2nd Class Excellent Textbook Award of the Ministry of Electronics Industry of China (1996).

Dr. Zhu is a senior member of IEEE, a member of ACM and a life member of the Chinese Association for Science and Technology, USA.