Tongjun   Ruan

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Education:

- **1995 - Doctoral Degree.** Computer Simulation in Petroleum Geology, Department of Energy Geology, China University of Geosciences, Beijing, China
- **1989 - Master Degree.** Department of Computer Science, Shandong University of Technology, Jinan, China.
- **1978 - Bachelor Degree.** Electrical Engineering, Shandong University of Technology, Jinan, China.

Professional Experience:

- **(04/2018--Present) Research Engineer,** Reservoir Evaluation and Advanced Computational Technologies(REACT) Group, Petroleum Recovery Research Center, New Mexico Tech, Socorro, New Mexico 87801
- **(06/2003-03/2018) Research Scientist,** Reservoir Evaluation and Advanced Computational Technologies(REACT) Group, Petroleum Recovery Research Center, New Mexico Tech, Socorro, New Mexico 87801
- **(08/2000-06/2003) Visiting Research Scientist,** REACT group of Petroleum Recovery Research Center, New Mexico Tech, Socorro, New Mexico 87801
- **(01/2000—07/2000) Visiting Professor,** Department of Computer Science, California Polytechnic State University, San Luis Obispo, CA 93407
- **(1996-2002) Associate Professor,** School Of Electrical Engineering of Shandong University of Tech., Jinan, Shandong Prov. China (* In 2000, Shandong University of Tech. was merged into Shandong University)
- **(1995-1996) Assistant Professor,** School of Computer Science and Technology, Shandong University of Tech., Jinan, Shandong Prov. China
- **(08/1978-08/1992) Lecture,** Department of Computer Science and Technology, Shandong University of Tech., Jinan, Shandong Prov. China

Recent Projects:

- **CarbonSAFE Phase III Project (2020---present)**
  Responsible for data processing.

- **Southwest Regional Partnership for CO2 Sequestration (2016--present)**
  Responsible for data processing.

- **GO-TECH** (2016---present)
  Responsible for data processing.

- **Field Testing and Diagnostics of Radial-Jet Well Stimulation for Enhanced Oil Recovery from Marginal Reserves (2011-2015)**
  RPSEA Small Producer Program p r o j e c t to determine placement and location of short lateral drilling bores. Responsible as technical lead and senior developer for design of a tiny

Data Logger with 3-chips (Microchip MCU, 3-axis Accelerometer/Gyro/Compass and SPI flash Memory) for use in a downhole environment. Developed control and data processing software, worked with drilling company on design of downhole tool and ran field tests.

- **New Mexico Pit Rules (2009-2011)**
  RPSEA Small Producer Program project to generate software and maps that predict reasonable financial cost and risk for locating a well/pit in any particular location in New Mexico, including predictable leaching, potential site regulatory issues, and to the degree possible, a reduction in the need for specialist on-site evaluations by online mapping of government accepted data and automated forms. I developed algorithms and software for searching or locating existing or proposed sites on online maps, server and client code and software to generate maps and transfer data to regulatory agency-supplied forms online

- **A Customizable Fuzzy Expert System for Regional and Local Play Analysis (CFS) (2005-2008)**
  DOE Project to design and implement a Customizable Fuzzy Expert System using Java Technology. Responsibilities included supervision of programmers designing both software and interfaces to guides users in step-by-step definitions of fuzzy expert systems. This tool built on expertise and systems developed in the FEE tool to create a system suitable for use in other basins or depositional environments.

- **Fuzzy Expert Exploration (FEE) Tool (2000—2005)**
  DOE project to design a state-of-the-art exploration "expert" tool, relying on a computerized database and computer maps generated by artificial neural networks. This tool used fuzzy logic. Two prototypes were created, one for the Delaware basin, New Mexico, and the other for the Devonian carbonates of New Mexico. Responsibilities as technical lead and senior developer included analysis and design of system architecture, management of project schedule and workload, programming, integrating, and testing the final product and creation of a standalone version as a supplement to the web-based system.

Publications:

1. **Ruan, T**., Balch, R.S.: " Estimate Radial Lateral Azimuth Using MEMS Inertial Measurement Unit(IMU) " , The 2019 International Conference On Embedded Systems, Cyber-Physical Systems and Applications, Las Vegas, NV, USA, July 29-August 1 , 2019.

2. **Ruan, T**., Balch, R.S.: "RPM Measurement using MEMS Inertial Measurement Unit (IMU) " , The 2018 International Conference On Embedded Systems, Cyber-Physical Systems and Applications, Las Vegas, NV, USA, July 31-August 2 , 2018.
3. **Ruan, T**., Balch, R.S.: "RPM Measurement Using 3-Axis Digital Magnetometer", The 2017 International Conference On Embedded Systems, Cyber-Physical Systems and Applications, Las Vegas, NV, USA, July 17-20, 2017.
4. **Ruan, T**., Balch, R.S.: "Development of Data Logger for Non-Wired Sensing and Recording for Small Lateral Paths", The 2016 International Conference On Embedded Systems, Cyber-Physical Systems and Applications, Las Vegas, NV, USA, July 25-28, 2016.
5. **Ruan, T**., Balch, R.S.: "The New Mexico Pit Rules Mapping Portal", The 2016 International Conference On E-Learning, E-Business, Enterprise Information Systems and E-Government, Las Vegas, NV, USA, July 25-28, 2016.
6. Balch R.S., **Ruan T**., et al, "Field Testing and Validation of a Mechanical Alternative to Radial Jet Drilling for Improving Recovery in Mature Oil Wells", SPE Western Regional

Meeting, Anchorage, AK,USA May 22-26, 2016

7. **Ruan T**., Balch, R.S.: "Development of 3-Axis Acceleration Data Logger for Non-Wired Sensing and Recording of wellbore paths", 2013 International Conference on Software Engineering and Computer Science(ICSECS2013), Yichang, China, Sep. 27-29, 2013.

8. **Ruan T**., Balch, R.S.: "An Interface Generator For Customizable Fuzzy Expert System ", 2013 International Conference on Software Engineering Research and Practice (SERP'13), Las Vegas, NV, USA, July 22-25, 2013.

9. Balch, R.S., S.M. Schrader, and **T. Ruan** (2007): "Collection, storage, and application of human knowledge in expert system development", *Expert Systems,* Vol. 24, No. 5 (November 2007) p. 346-355.

10. Balch, R. S., **T. Ruan**, and S. Schrader (2005): "Fuzzy Expert Systems in Oil Exploration", SIAM Conference on Computational Science and Engineering, Orlando,Florida, Feb. 12-15, 2005.

11. Schrader, S.M., Balch, R.S., *Ruan***, T**. (2005): "Using Neural Networks to Estimate Monthly Production: A Case Study for the Devonian Carbonates, Southeast New Mexico," paper **SPE 94089**, 2005 SPE Production and Operations Symposium, Oklahoma City, April 17-19.

12. Schrader, S.M., R.S. Balch, and **T. Ruan**: "Knowledge Management, Collection and Storage in Expert System Development," *Upstream CIO* (September 2005) 22-24.

13. Balch, R. S., **T. Ruan**, W. W. Weiss, and S.M. Schrader (2003): "Simulated Expert Interpretation of Regional Data to Predict Drilling Risk," paper **SPE 84067,** 2003 SPE Annual Technical Conference and Exhibit, Denver, October 4-8.

14. Balch, R. S., **T. Ruan**, and S. Schrader (2003): "Automating Basic Exploration Processes Using an Expert System: Applications to the Delaware Basin," In: *The Permian Basin: Back to Basics*: West Texas Geological Society, Publication **No. 03-112**, p. 285-294.

15. Schrader, S. M., R.S. Balch, and **Ruan, T** (2003): "Preserving and Applying Expert Knowledge: A Case Study for the Brushy Canyon Formation of the Delaware Basin", In: *The Permian Basin: Back to Basics*: West Texas Geological Society, Publication **No. 03-112**, p. 295-304.

16. Balch, R.S., W.W. Weiss, and **T. Ruan** (2002): "Simulated Expert Interpretation of Data to Predict Drilling Risk on a Regional Scale, Case Study—Brushy Canyon Formation, Delaware Basin, New Mexico," In: *The Permian Basin:Preserving our Past – Securing Our Future*: West Texas Geological Society, Publication **No. 02-111**.

17. Robert Balch, Susan Schrader and **Tongjun Ruan**, "Collection storage and application of human knowledge in expert system.", Expert System , Nov, 2007, Vol.24, No. 5.

18. **Tongjun Ruan**, "Design and Application of Basin Modeling System," Journal of Shandong University of Technology, Vol. 1, 2000.

19. **Tongjun Ruan**, "Design and Implementation of Real-time Distribution Database for Power Distribution Automation System," Journal of Shandong University of Technology, Vol. 4, 1999.

20. **Tongjun Ruan**, "One Dimensional Basin Modeling System on Microcomputer," Microcomputer Information, Vol. 5, May 1998.

21. **Tongjun Ruan**, "Real-time distribution database for distribution automation system," Computer Application, No.11, Nov. 1998.

22. **Tongjun Ruan**, "Object-oriented Programming in Real-time Database Design," Research on Computer Applications, No. 4, 1998.

23. **Tongjun Ruan**, "Update of Real-time Distribution Database for Power Distribution Automation System," Research on Computer Applications, No. 4, 1998.

24. **Tongjun Ruan**, "Development of Fuzzy Control Theory and Application", Shandong Electronics, No. 4, 1988.

25. **Tongjun Ruan**, "Designing of Fuzzy Controller with Good Dynamic and Static Characteristics," Shandong Electronics, No. 2, 1996

26. **Tongjun Ruan**, "One Method of Designing Fuzzy Controller," Computer Applications, Vol.16, No. 5, 1996.

27. **Tongjun Ruan**, "One Method of Computing Fuzzy Control Table," Microcomputer Development, No. 5, 1996.

28. **Tongjun Ruan**, "Three Dimensional Computer Simulation System of Sequence stratigraphy," Research on Computer Applications, No. 6, 1996.

29. **Tongjun Ruan**, "One Method of Protect Application Software", XinLangCaho, No. 5,1995.

30. **Ruan, T**., Balch, R.S., and Schrader, S.M.: "A Fuzzy Expert System for Oil Prospecting in the Lower Brushy Canyon of SE New Mexico", IEEE International Conference on Information Reuse and Integration, Las Vegas, NV August 15-17,2005.

31. **Ruan, T**., Balch, R.S., Hart, D.M. and Schrader, S.M: "A Web-Based Fuzzy Ranking System and Application", the 9th World Multiconference on Systemics, Cybernetics and Informatics, Orlando FL, USA, in July 10-13, 2005.

32. **Ruan, T**., Balch, R.S., and Schrader, S.M.: "A Web-based Database Management System", the IASTED International Conference on Communications, Internet and Information Technology (CIIT 2004), November 22 to November 24, 2004, at St. Thomas, Virgin Islands, USA.

33. **Ruan, T**., Balch, R.S., and Schrader, S.M.: "The Fuzzy Expert Exploration Tool", Sixth IASTED International Conference on Intelligent Systems and Control, Honolulu, August 23-25, 2004.

34. **Tongjun Ruan**, "Fuzzy Control Model and Its Algorithm", China Automatic Control Annual Conference, HuangShan, Anhui,China,1995.

35. **Tongjun Ruan**, "A method of Protecting Software", China Computer Security Annual Conference", 1994.

Professional Affiliations:

1. The Society of Petroleum Engineers

Adjunct Position:

1. Adjunct Faculty with department of Petroleum Engineering, New Mexico Tech. 2005-2018

Synergistic Activities:

1. Judge of Senior Computer Science in INTEL International Science Fair, Albuquerque, NM 2007.
2. Judge of New Mexico State Science Fair, Senior Computer Science, 2008--2016.
3. Judge of New Mexico State Science Fair, Junior Computer Science, 2019.
4. Session Co-Chair of "Topics in Embedded Systems, Cyber-Physical Systems and Applications" Las Vegas, NV, USA, July 25-28, 2016.
5. Session Chair -- IEEE International Conference on Information Reuse and Integration, Las Vegas, NV August 15-17, 2005.