

Curriculum Vitae

Rosemary A. Irrgang

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Academic Qualifications: Master of Petroleum Engineering University of NSW 2005 (part time)
PhD, Aeronautical Engineering , Sydney University, 1996 (part time)
MEngSc, Electrical Engineering, Sydney University, 1982 (part time)
BSc, Sydney University, 1969

Current Position:

Consultant with Irrgang Reservoir Management

Activities include field development planning, well testing, reservoir fluid flow modelling and simulation, gas composition and PVT, reserves estimation and risk assessment. Master of Petroleum Engineering course with University of NSW completed part time with high distinction WAM (weighted average mark). Courses completed include Petroleum Geophysics, Petroleum Geology, Formation Evaluation, Reservoir Engineering I and II, Numerical Reservoir Simulation, Petroleum Economics and Well Testing. Current work involves mainly well test analysis using the Saphir modelling program, reservoir simulation and compositional studies for AWE, Beach Petroleum and Origin Energy.

CSIRO Mathematical and Information Sciences (1988-2003)

Employed as Senior Research Scientist 1995-2003, working with CSIRO Petroleum.

Responsible for research and development of innovative technology systems for the Genesis project and spin off operations. Genesis is a 5 million dollar oil and gas industry project to produce an intelligent system for optimal drilling and field development with risk assessment and economics. The global project was funded by 6 oil companies with another 5 contributing data. Case based reasoning, fluid flow modelling and natural language information extraction and retrieval technologies were developed and the system has been sold to oil and service companies in Egypt, USA, Europe, Brazil Mexico and Australia. Spin off projects include "Well Quality and Risk Assessment for Deepwater Wells", and "Completions". Both projects were funded by industry for several million dollars.

CSIRO Mineral Engineering Division (1983 to 1988):

Employed as engineer, Control Systems and Fluid Mechanics groups, working mainly on:

- Design and development of software and modelling algorithms for simulation and real time control of industrial processes.
- Interfacing of instruments for real time data logging and feedback control in mineral processing plants
- Preparation of tenders for computing and instrumentation equipment

CSIRO Marine Science Division (1970 to 1983):

Employed as scientific computer analyst and system manager. The work involved

- Developing databases and systems for processing of large scale oceanographic, biological and chemical data collected using Divisional research vessels.
- Tender preparation for shipboard instrumentation and computer equipment
- Design of algorithms and software for automation of shipboard data logging and control processes
- Oceanographic modelling and statistical analysis

Career Highlights

Responsible for IT project management and industry liaison, design, implementation and acceptance testing of industrial software projects including:

- Pipesafe: Defect assessment system for girth welding in oil and gas pipelines
- Intelligent image processing system for automated interpretation of flow visualisation videos for wind tunnel experiments for aerospace industry, using case based reasoning and machine learning (PhD project)
- Multimedia system for natural language based retrieval of Roads and Transport Authority (RTA) information for use in RTA offices and shopping centres
- Closed loop feedback optimisation and control of cyclone system for BHP Stockton Borehole Coal plant
- Real time automation and interactive data logging system on board Research Vessel "Sprightly"
- Modelling and simulation of stochastic processes in industrial applications for BHP, Mt. Isa Mines and CRA
- Large scale oceanographic database retrieval and processing system containing data collected since 1940.

Master of Petroleum Engineering by Coursework

Academic Statement

The University of New South Wales

Name : Irrgang, Rosemary Anne
Student ID: 3122379
Print Date : 2006-01-17

----- Degrees Awarded -----

Degree : MEngSc
Completion Date: 2006-01-06
Specialization: Petroleum Engineering

		Units Passed	Mark	Grade	
GEOL 9151	Petroleum Geology	6.00	6.00	87	HD
PTRL 6001	Reservoir Engineering 1	6.00	6.00	80	DN
PTRL 6007	Reservoir Engineering II	6.00	6.00	85	HD
PTRL 6107	Formation Evaluation	6.00	6.00	85	HD
GEOL 9152	Petroleum Geophysics	6.00	6.00	86	HD
PTRL 6004	Numerical Res. Simulation	6.00	6.00	88	HD
PTRL 6003	Well Pressure Testing	6.00	6.00	97	HD
PTRL 6008	Petroleum Production Economics	6.00	6.00	91	HD

8655 Petroleum Engineering Totals

WAM: 87.375

UNITS : 48.00 48.00

Research Publications

1. Simon Kravis and Rosemary Irrgang, "A Case Based System for Oil and Gas Well Design with Risk Assessment", *Journal of Applied Intelligence*, 23, 39-53, April 10, 2005.
2. S. Kravis, R. Irrgang, A. Phatak, CSIRO CMIS, A. Martins, Petrobras S.A., E. Nakagawa, SPE 77358, "Drilling Parameter Selection for Well Quality Enhancement in Deepwater Environments", SPE Annual Technical Conference, San Antonio Texas, Oct 2002.
3. Rosemary Irrgang, Simon Kravis, Edson Nakagawa, "Drilling Knowledge Management, What is Missing and Can We Fix it?", IADC/SPE 77249, IADC/SPE Asia Pacific Drilling Technology, Jakarta, Indonesia, 9–11 September 2002.
4. Simon Kravis and Rosemary Irrgang, "A Case Based System for Oil and Gas Well Design", in 15th international conference on Industrial and Engineering applications of Artificial Intelligence and Expert Systems, Cairns June 17-21 2002.
5. Irrgang, R., Irrgang H., Kravis, S., Irrgang S., Thonhauser, G., Wrightstone A., Nakagawa, E., Agawani, M., Lollback, P., Gabler, T., Maidla, E.: Assessment of Risk and Uncertainty for Field Developments: Integrating Reservoir and Drilling Expertise: SPE Annual Technical Conference and Exhibition, New Orleans, USA, SPE 71419, Oct, (2001)
6. R Irrgang, S Kravis, P Scott, T Gabler, E Maidla, G Thonhauser, "The Drilling Club: a Knowledge Exchange for Best Practice Operations":, *Petrotech New Delhi*, Jan 9-11, 2001
7. Rosemary Irrgang, "Knowledge Exchange In Distributed Groups", CSIRO Project Leaders Program 10, completed June 2000.
8. Irrgang, R.; Maidla, E.E., Damski, C.; Millheim, K., "A Case Based System to Cut Drilling Costs", SPE Annual Technical Conference and Exhibition, October 1999.
9. Irrgang R. , Kravis S. P. , Agawani M. M. , Maidla, E. , "Automated Extraction of Drilling Experience: Capture and Reuse of Engineering Knowledge", *Petrotech Conference*, Jan 1999, New Delhi.
10. Jaffe L. , Maidla E. , Irrgang R. , Janisch W. , "Casing Design for Extended Reach Wells" in *SPE Annual Technical Conference San Antonio Texas*, October 1997, SPE 38617, PP 1-11.
11. Irrgang R. and Irrgang H. , "An Intelligent Snake Growing Algorithm for Fuzzy Shape Detection", in *Journal of Expert Systems with Applications*, Vol 11, no. 4 pp 531-536, 1996.
12. Irrgang R., "Automatic Shape Indexing and Rapid Multimedia Retrieval using Intelligent STIRS Signatures", in *Multimedia Modelling*, Eds. Tat Seng Chua, Hung Keng Pung, Tosiyasu L Kunii, World Scientific, Singapore, ISBN 981-02-2502-4 pp 99-114, Nov. 1995.
13. Moss C. J. , Irrgang R. , Stathers P. , Barbaro F. , Bowie G. , "Development of Software for Engineering Critical Analysis of Pipeline Girth Welds", WTIA/APIA Joint Research Seminar, *Welding of High Strength Thin Walled Pipelines*, Wollongong October 1995.
14. Moss C. J. , Irrgang R. , Stathers P. , Barbaro F. , Bowie G. , "Pipesafe, Engineering Critical Assessment Software for Pipeline Girth Welds", in *Asian Pacific Welding Congress*, Auckland New Zealand, 5-7 Feb. 1996
15. Irrgang R. and Irrgang H. , "An Intelligent Snake Growing Algorithm for Fuzzy Shape Detection", *Proc. of the Third World Congress on Expert Systems*, Seoul, Korea, Feb. 5-9, 1996.
16. Irrgang R. , "A Case Based System for Adaptive Image Understanding", thesis submitted for *Doctorate of Philosophy, in the Faculty of Aeronautical Engineering*, University of Sydney, August 1994.
17. Irrgang R. and Irrgang H. , "A Case Based System for Adaptive Image Understanding", *The Second World Congress on Expert Systems*, Lisbon/Estoril Portugal, Jan. 1994, Published on CD-ROM, "Moving Toward Expert Systems Globally In The 21st Century", Macmillan New Media, Cambridge MA, USA.
18. Irrgang R.A., Venkatachalan K. , and Chung C. , "Intelligent Systems in Australian Industry; A Study of Current Status and Future Trends", *The Second World Congress on Expert Systems*, Lisbon/Estoril Portugal, Jan. 1994, Published on CD-ROM, "Moving Toward Expert Systems Globally In The 21st Century", Macmillan New Media, Cambridge MA, USA.
19. Lindley C.A , Kumar V.R , Irrgang R. and Robertson J.R. , "An Evaluation of Information Retrieval Methods and Semantic Network Processing for Automatic Link generation in Hypermedia Systems", in *The Second International Interactive Multimedia Symposium*, Perth, WA. January 1994 pp290-297.
20. Kumar V. R. , Irrgang R. A, Lee M. , Chung C.Y.C. and Alem L. , "Recent Trends in Artificial Intelligence for Enhancing Knowledge Based Systems", in *Artificial Intelligence Technology*,

Applications and Management, editors E. Balagurusamy and B. Sushila, Tata McGraw-Hill pp 5-12, 1993.

21. Irrgang R. A. , "Machine Learning and Knowledge Based Techniques for the Automated Estimation of Turbulent Flow Vectors from Video Images", *Recent Advances in Experimental Fluid Mechanics*, Ed. F.G. Zhang, International Academic Publishers, 465-470, 1992.
22. Irrgang R. and McGowan C. , "Architecture of a Distributed Decision Support System", in *The Fifth Australian Software Engineering Conference*, Sydney, May 1990 pp 183-188.
23. Abulnaga B. , Irrgang R.A. and Hooper J.D., "An Experimental Investigation of Velocity and Pressure Profiles of Annular Swirling Flows in the Sirosmelt Lance", *Mineral Engineering Restricted Report*, June 1989, 43 pages.
24. Abulnaga B. , Irrgang R.A. and Hooper J.D., "Low Speed Testing of the Cobra Four Hole Pressure Probe", *Mineral and Process Engineering Communication*, MIE/C-37, Feb. 1989.
25. Irrgang R. and Hooper J. , "Bath proximity and Jet Width Effects for the Floater Pad Jet Stripping System", *Mineral Engineering Restricted Report*, September 1987.
26. Hooper J.D. and Irrgang R., "Wall Shear Stress Measurement -A Comparison of the Directional Response of the Preston, Stanton and Wall Block Probes", in *Experimental Heat Transfer , Fluid Mechanics and Thermodynamics*, Ed. R.K.Shah, E.N.Ganic, amd K.T. Yang. Elsevier Science Publishing Co. Inc. 1988.
27. Hooper J.D., Irrgang R. and Davies M.R., "Identification of the Primary Cyclone Circuit in a Coal Washery", *The Third International Conference on Control Engineering*, Sydney May 1986.
28. Irrgang R. and Hooper J. , "Practical Experiences with Process Modelling and Control", in *Proc. of The Digital Equipment Computer User's Society*, 1985, pp 81-85.
29. Irrgang R., "Automation of a Seagoing Autoanalyser", *Proc. of The Digital Equipment Computer Users Society*, 1984, pp 79-84.
30. Irrgang R. A. , "DIMSIM, A Microprocessor-Based Logic Trainer", *Master of Engineering Science Thesis*, Faculty of Electrical Engineering, University of Sydney, Jan. 1982.

Professional Training Highlights

- Probabilistic Reserves Estimation
- Multilateral Well Design
- Well Completions
- Project Leader training (several courses)
- Project Management and Function Point Analysis (several courses)
- Design of Testing Procedures
- Negotiation training
- Total Quality Management
- Object Oriented Design and Development (Mentor)
- X Windows System course
- Object oriented C++ Course
- Web Page Design (Frontpage)

Software/Computing Experience

Main Languages Used:

- Visual Basic Enterprise Edition version 6
- Fortran 77, Fortran 90 (Lahey)
- C, C++
- Access, Excel
- VBA for Excel and MSWord
- Assembly languages (mainly for writing device drivers)

Operating Systems Used

- Microsoft Windows 95-2003
- Unix: Sun and IBM
- Foxboro real time control language