



Ruiping Ma, Ph.D., M.S., B.E.
Software Engineer

Expertise

Computer engineering, computer science, fault intrusion tolerant computing, networking, reliable and secure wireless sensor network data transmission, software development, data analysis, data acquisition, web development, system documentation.

Qualification Summary

- More than 10 years of experience in the fields of computer engineering, computer science, software developing, and data analysis.
- Underwater vehicle and software development for biogeochemical and physical oceanographic investigations, and fisheries research.
- Data acquisition and data analysis.
- Windows, Unix/Linux and Embedded System programming.
- C#, C/C++, Python, MySQL, SQL Server, PHP, HTML, JavaScript, CSS, Shell Script, MATLAB.
- Campbell Scientific Software
- Strong independent research and problem-solving skills.

Work Experience

2014-Present	Woods Hole Group, Inc., Software Engineer
2013-Present	School for Marine Science and Technology (SMAST), University of Massachusetts Dartmouth (UMassD), Research Associate
2005-2012	SMAST, UMassD, Web Assistant
2004-2011	ECE Department, UMassD, Research Assistant
2006-2009	SMAST, UMassD, Research Assistant
1999-2004	CASIC, Senior Computer Engineer

Education

Ph.D., Computer Engineering –
2013 University of
Massachusetts Dartmouth
M.S., Computer Science – 1999
The Second Academy of China
Aerospace Science & Industry
Corp. (CASIC), Beijing, China
B.E., Computer Science – 1996
Zhengzhou University, China

Professional Affiliations and Awards

Member of IEEE

Member of IEEE-Eta Kappa Nu
(IEEE-HKN), Electrical and
Computer Engineering Honor
Society

Best Paper Award at the IEEE
International Conference on
Networking, Architecture, and
Storage (2009)

Best M.S. Thesis Award. The
Second Academy of CASIC,
China (1999)

Publications and Presentations

5

Key Projects

Helix Q5000 ADCP Launch and Recovery System (LARS), Gulf of Mexico, Software Developer

Developed software for data acquisition, processing and archiving, analysis, quality control, and system status monitoring and crash recovery for the Helix Q5000 ADCP Launch and Recovery System. This newly designed system includes two TRDI ADCPs - an upward-looking 300kHz Workhorse and a downward-looking 38kHz Ocean Observer - as well as integrated electro-mechanical cables, dual winches with slip-rings and an articulated A-frame. The system transmits 1000m current profiles every 20 minutes in real-time to the vessel and to both WHG and the National Data Buoy Center. The largely automatic system provides power and control signals to the instruments, collects and processes data, and provides real-time displays to operators over the on-board CCTV network.

BP MadDog Real-Time Metocean Mooring System, Gulf of Mexico, BP, Software Engineer

Improved the system software and developed new functions for user control, data acquisition, depth mapping, data processing, data display, data quality control, system monitoring and maintenance, and database management for the combined current, wave, and wind measurement system deployed near BP's Mad Dog production platform in the deep waters of the Gulf of Mexico since 2013.

Real-Time Moored Metocean Systems, Software Engineer

Developed software modules that receive, process, and archive raw data collected from current profiler, wave, and meteorological sensors on offshore moored metocean systems. The suite of software modules also applies QA/QC procedures, feeds clean data to website displays, and provides a system-level watchdog capability with automatic fault recovery. Real-Time Metocean Mooring (RTMM) systems include:

- **BP Trinidad & Tobago, offshore south coast of Trinidad, 90m water depth**
- **Ecopetrol, offshore Caribbean Coast of Colombia, 65m water depth**
- **Chevron, offshore Brazil, Campos Basin, 1200m water depth.**

Developed code for processing and displaying current profile data from a Nortek Signature 55 Doppler profiler mounted on the Chevron 3m surface buoy.

Shell QCd NTL Data, Software Engineer

Helped in preparing the proposal for development of a database of quality controlled current data for specific areas of interest to Shell in the Gulf of Mexico.

Website for Rig Data, WHG, Software Engineer (ongoing)

Ongoing development of a website for customer and WHG use. The site presents current profile data, quality control information, and engineering status for rig and mooring systems deployed in the Gulf of Mexico by WHG. The displays and available downloads allow customers to readily visualize data from multiple sites and provide trouble-shooting information to WHG engineers to support rapid analysis and response. The site is scalable and may ultimately be expanded to host all GOM systems providing NTL data to NDBC.

Rig System Maintenance, WHG, Software Engineer

Participated in the maintenance of real-time offshore oil rig systems. Monitoring the performance of the rig systems, responding to clients' requests and troubleshooting system problems.

Key Projects (continued)

GulfCarbon Project, SMAST, University of Massachusetts at Dartmouth, Research Associate

Activities included programming and analyzing hyperspectral radiometric data collected from cruises in the northern Gulf of Mexico. Methods were developed to interpret the spectral (or color) signatures of ocean waters and to derive estimates of different biogeochemical constituents. The goal of the research was to improve understanding of the diverse processes that influence optical properties and their relationship to key constituents including algal pigments, chromophoric dissolved organic matter and suspended particulate matter. Ship-based underway hyperspectral observations of remote sensing reflectance, including extending into the UV-B spectral range, were analyzed. The complementary observations of surface hyperspectral radiance and irradiance and in situ measurements of apparent and inherent optical properties and key constituents in coastal waters of the northern Gulf of Mexico provided a rich dataset for evaluating spectral algorithms. Measurements of hyperspectral radiance and irradiance were compared to satellite observations, thus allowing for broad spatial and temporal coverage in conjunction with the higher frequency sampling.

Hybrid Programmable Underwater Profiler (HPUP), SMAST, University of Massachusetts at Dartmouth, Research Assistant

Graduate research assistant and software developer for the HPUP system, which is an autonomous underwater vehicle developed in a collaborative effort with Brooke Ocean Technology. The goal of the project is to develop an inexpensive and versatile AUV platform that combines the range and flexibility of horizontal navigation with the ability to conduct vertical profiles while carrying a customizable scientific payload.

Data Acquisition & Software Control Interface for the Acoustical-Optical Platform (AOP) system for the Ocean Groundfish Acoustics Program, SMAST, University of Massachusetts at Dartmouth, Research Assistant

Graduate research assistant in the Ocean Groundfish Acoustics Program, SMAST, UMass Dartmouth. The Ocean Groundfish Observatory is a two-component system using acoustical and optical sampling techniques to assess groundfish stocks. The first component is a stationary acoustical-optical platform (AOP) mounted on the sea floor. The AOP uses a combination of active sonar, low-light video cameras, and a suite of sensors to monitor fish activity and environmental conditions near the platform. The second component is an autonomous underwater vehicle called FINTAN, fitted with five low-light deep sea cameras. Primary responsibilities included data processing, field support, software programming, and hardware development of sonar and video equipment. Data processing of sonar data occurred using Matlab and fisheries statistics programs. Video processing was performed with video software packages. Software programming was performed in Linux, C/C++, and Matlab. Also took part in system calibrations, field experiments, data analysis, program presentations, and technical writing.

Publications and Presentations

Ma, Ruiping, L. Xing, H. E. Michel, and H. Wang. 2011. "Survivable Data Transmission via Selective Hybrid Cipher in Sensor Networks," *International Journal of Performability Engineering*, Vol. 7, No. 4, pp. 303-312, July 2011.

Ma, Ruiping, L. Xing, H. E. Michel and V. M. Vokkarane. 2012. "Linear Cryptanalysis of A Survivable Data Transmission Mechanism for Sensor Networks," *The IEEE International Conference on Technologies for Homeland Security*, Waltham, MA, November 13-15, 2012.

Ma, Ruiping, L. Xing, T. Jin, and T. Song. 2009. "A Data Transmission Mechanism for Survivable Sensor Networks," *Proc. of The IEEE International Conference on Networking, Architecture, and Storage (NAS)*, pp. 9-15, ISBN: 978-0-7695-3741-2, Zhang Jia Jie, China, July 9-11, 2009 (Best Paper Award, 25% acceptance rate)

Publications and Presentations (continued)

- Ma, Ruiping, L. Xing, and H. E. Michel. 2007. "A New Mechanism for Achieving Secure and Reliable Data Transmission in Wireless Sensor Networks," Proc. of The 2007 IEEE International Conference on Technologies for Homeland Security, Woburn, MA, May 16-17, 2007, pp. 274-279.
- Ma, Ruiping, L. Xing, and H. E. Michel. 2006. "Fault-Intrusion Tolerant Techniques in Wireless Sensor Networks," Proc. of the 2nd IEEE International Symposium on Dependable, Autonomic and Secure Computing (DASC'06), Indianapolis, September 29-October 1, 2006.