ANDROMEDA Computer Systems Ltd.
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Consultant Profile
JOHN HEEREMA, Ph.D.

Experience

Dr. Heerema is a senior leader with over a quarter century of practical experience. His expertise combines leadership with deep technical knowledge.

Special Skills

Leadership

Dr. Heerema excels in the coordination of teams with several dozen members. One of his strengths is establishing effective communication between multiple companies, departments, and work groups within an enterprise.

Fiscal responsibility

Managed projects with total values of up to $80M, delivering projects on budget and on time.

Software

Dr. Heerema is a software development expert, with deep experience in both leadership and technical roles. He is also a world authority in computational auditory scene analysis.

Resource industry

Dr. Heerema has worked in Canada's resource industry for several decades in leadership and technical capacities.

Education

PhD (Computational Auditory Scene Analysis), University of Calgary.

MSc (Digital Signal Processing), University of Calgary, GPA of 4.0.

BSc (Computer Science and Pure Mathematics), University of Calgary.

Application Areas

Digital Signal Processing and Control

Dr. Heerema conducts joint time-frequency domain analysis of complex audio signals, such as human speech and vibration analysis.

Software for Mobile Devices

John is an iOS development expert, including the new Swift programming language, database management, complex graphics, and audio analysis. His focus is on delivering well-designed, easy to use systems.

Pipelines

Project Management, design, and development of software for both engineering and IT, including turbocompressor performance monitoring, vibration analysis, pipeline leak detection, and electronic flow measurement.

ETRM (Energy Trading and Risk Management)

Retained as Project Manager for an initiative to create a market for electrical reserves (Ancillary Services), select risk management tools, and create software for load forecasting, deal capture, scheduling, and settlement. Retained by another major energy distributor to select an ETRM system, and to plan the implementation process for both regulated and unregulated trading activities.

Educational Games

Develops games and real-time performance feedback to improve real-world skills.

Awards

- Our "Booze Cruise" driving game received national attention for it's entertaining approach to educating drivers about the effects of alcohol on driving. We received a first place award for it at the FuturePlay 2007 competition, and it was later purchased by the U.S. Department of Defense.
- Led a project to create the world's first commodity market for electrical reserves, 2000-2001
- APEGGA "Summit" award, 1994 (one of two senior members of the team associated with this corporate award)

Notable Projects

Software Development

Retained by a major instrumentation manufacturer to create both embedded software and desktop software to configure and analyze data from its gas analyzers and gas chromatographs.

Created websites that show every aspect of analyzer configuration and operation.

Retained by an airborne LIDAR corporation to create software to configure and analyze real-time data for still and video cameras, fibre optic gyroscopes, differential GPS, and scanning lasers. Developed algorithms for real-time camera positioning, beam coverage analysis, and displays for LIDAR operators and helicopter pilots.

Technologies: C++, C#, LabVIEW 2005-2018

Mobile Devices

Developed iOS software to analyze audio-frequency signals in real time. Created new techniques and algorithms for joint time-frequency domain signal analysis. This system is currently the most accurate software in the world for musical pitch analysis.

Technologies: iOS, Swift, Objective C, SIMD vector processing 2005-2018

ETRM Selection

Retained by a major energy company to evaluate and select a product for its regulated and unregulated Energy Trading activities, and to select appropriate risk management tools.

Coordinated vendor presentations, product evaluation, and integration paths with the existing risk management toolset.

Technologies: Commercial ETRM product selection Spring-Summer 2006

Commodity Trading & Risk Management

Retained by the Transmission Administrator (TA) for Alberta, as the Project Manager and Software Architect for an initiative to trade electrical reserves on a commodities exchange. This project was successfully completed on time, in the very dynamic business environment of electrical deregulation

The initial scope was to identify requirements, and obtain buy-in from all of the affected companies and departments. Following this, a project was raised, and Mr. Heerema recruited a team to develop systems to support on-line trading, risk management, demand forecasting, compliance monitoring, financial settlement, and asset substitution.

The on-line trading component of the system tracks the TA's real-time position, and ranks incoming bids and offers for the traders, based on price and risk (in this case the risks being managed are cost, the dynamic probability of reserve deployment, and the geographical proximity of assets to the projected demand). The system can communicate with multiple exchange floors via secure XML links that transmit bids, offers, and trades. Dispatch instructions are sent to the System Controller.

The system forecasts demand using past history and a weather forecast feed from Environment Canada, and provides Alberta's most accurate electrical load forecasts. It also monitors the performance of reserve providers using SCADA telemetry, and allows reserve providers to nominate assets via a secure web interface.

Technologies: Secure XML, Java, Web services, Oracle, Metrix ND, LabVIEW Oct 2000 - Sept 2001

PPDM

An occasional speaker at PPDMA conferences, addressing data content, and integration best practice.

Technologies: database and EAI 2003-2007

Integration Coordinator

Retained as the Integration Coordinator for TransCanada Pipeline's "Best of Breed" Program Management Office (PMO).

This $80M programme replaced SAP with a suite of applications from various vendors, and functionally integrated them. Responsible for setting integration testing standards, identifying test team leaders, coordinating infrastructure development, resolving integration issues, establishing Change Management practices, and acting as the Change Coordinator.

Coordinated a small staff within the PMO, and several dozen test leaders and testers in seven Best of Breed projects.

Reported to the PMO and the Best of Breed steering committee. This program was successfully implemented on time.

Technologies: Enterprise 1000 server, Java, Web, Sybase, Oracle, XML, Forte Fusion, etc.
Mid 1999 - Sept 2000

Mission-Critical Testing

Acted as the Team Leader responsible for Year-2000 testing of the systems identified as "Mission Critical" for Nova Gas Transmission Ltd., focusing on the Gas Measurement & Accounting areas.

Coordinated the activities of over 60 people, to create an isolated network of computer systems, develop test plans, execute them, and resolve issues.

Technologies: MQ-series middleware, clustered servers, secure networks, formal testing, Web, Oracle, Adabas, C++, Expert systems, legacy integration. Mid 1998 - Mid 1999, at 50%

Vendor Management

Planned an upgrade to all flow computers in the Nova/TransCanada measurement system.

Conducted a software audit of the embedded software incorporated into gas measurement computers in the Nova pipeline system.

Following this, developed project execution, and quality assurance standards for new flow computer software to be deployed throughout the system.

Acted as Nova's technical representative during the development project, responsible for coordinating and approving vendor activities.

Although the vendor was initially reluctant to follow the standards and procedures, they ultimately acknowledged that the system could not have been built on time without them.

In a later project, worked to validate a new generation of flow measurement equipment to be used across North America.

Technologies: Design validation, formal testing and acceptance, automated test tools.

1998 - 1999; 2015

Magnetic Bearing Research

Principal software architect for a variety of high-speed control and data analysis systems. One of these systems was the recipient of the 1994 APEGGA "summit" award for achievement. Another was featured as the cover story for an issue of "International Turbomachinery".

One of two senior members of a mixed-discipline team developing magnetic bearing technology, from hybrid analog-digital systems to multiprocessor digital control systems. Responsible for control algorithm design, DSP-based digital control systems, and data visualization systems.

Technologies: LabVIEW, C++, MatLab, Mathematica, 68332 and 56002 assembly, signal analysis, predictive control, and large turbocompressors. 1988-1994

Personal

Dr. Heerema is an avid photographer and Photoshop expert. He specializes in very large canvas prints of the Canadian landscape, and ski photography. He enjoys reading, music, biking, cooking, and hanging out with his kids (www.heerema.ca).

He designed and built his home to minimize its environmental footprint (R-2000 building practices, and minimal site impact).

He has climbed the highest peaks in North and South America, is a high-level cross-country ski instructor and serves on the Board of Directors for the Canadian Association of Nordic Ski Instructors. He built a harpsichord, has taught at the University of Calgary, and has done volunteer work overseas for a medical NGO.

His PhD research focused on joint time-frequency analysis of music, and on developing a tool for to help musicians sing and play better.