2005 DUKE'S CHOICE AWARDS WINNERS

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COMMUNITY CATEGORY

Java Sensor Networks Go To Sea

Company: Sun, Agilent, SF State University, Romberg Tiburon Institute
Location: San Francisco Bay Area
Java: J2SE 1.41; Sensor network: J2SE 5.0, JXTA
URL: http://jddac.dev.java.net

Description: One of the java.net communities (Java Distributed Data Acquisition and Control, JDDAC) has created a very cool (and very real world) working demonstration of Java technology - "Java Sensor Networks go to Sea." Essentially the concept of a network of Java sensors is being piloted to monitor San Francisco Bay water quality - this is a real world project between Sun, Agilent, SF State University, and Romberg Tiburon Institute (think of a network of Java enabled sensors deployed in the Bay to monitor water quality, including temperature, etc.). An existing demo consists of both a live monitoring of Bay water quality from a real world deployed Java sensor network in Tiburon and also a (quick) stage demonstration of how this technology works. In addition, JXTA is used to gather and share the data.

DESKTOP CATEGORY

Introductory Algebra Graphers

Company: SAS InSchool
Location: Cary, NC
Java: J2SE 5.0
URL: http://www.sasinschool.com/

Description: The Introductory Algebra Graphers from SAS inSchool allow students to visualize functions and their graphs. These tools support linear and non-linear functions, as well as systems of linear equations and inequalities. Students explore by observing the impact of changing the functions and/or dragging points and lines. Then users can either test their knowledge with prepared problems or enter their own problems. Answers are either checked immediately, or stored on an answer page, depending on the mode. The latter can be printed, saved, and/or emailed to the teacher. Users can also copy graphs and equations to the system clipboard. A key element of these tools is the built-in math editor, which formats the mathematics to match the style commonly used in textbooks. These tools are designed for use in secondary schools nationwide. Thus web deployment, client-side JAR caching, and applet sandboxing are essential to providing a scalable and secure deployment solution. In addition, Java's API provides simple and secure access to the client-side file system, network, printers, system cache, and clipboard. On the development end, the expansive Java API (including Swing) and the availability of high-quality tools (e.g., Eclipse and JTest) have substantially reduced our development time and enabled rapid prototyping. Object-oriented design elements provided by Java, such as interfaces, abstract classes, static methods and variables, and polymorphism, are used extensively in our designs. In addition, supplemental packages available for Java have allowed us to expand our capabilities into new areas, such as the use of email and servlets.

ENTERPRISE BACKEND CATEGORY

The City of São Paulo Integrated Patient Scheduling System

Company: Atech Foundation
Location: São Paulo, Brazil
Java: EJB 2.0, JTA, JSP, Servlets, Struts, J2SE 5.0, Annotations
URL: http://www.chaves.com.br/TEXTSELF/HEALTH/washington.htm

Description: Sao Paulo is the largest city in Brazil and the third in the world, with a population of about 14 million people. Some 7 million people are attended under the National Health System (SUS). In 2003, Sao Paulo City started a huge project aiming at building an integrated web-based system to collect patient encounter information, to regulate attendance - which includes complex procedures authorizations, and to build an integrated patient scheduling system that would allow for scheduling consultations and medical procedures in any of the 700 healthcare providers in the city. These processes reduce waiting time, organize patient flow and greatly improve the quality of care by optimizing resources. J2EE technology was extensively used to build this mission-critical application and to achieve the required level of integration. Using J2EE technologies such as EJB, Servlets, JSP, JMS, JTA, and JAAS, it was possible to create a robust and high-performance application, with a high level of reuse and flexibility. Taking advantage of the new Java Annotations Facility, a large part of the code was automatically generated, which sped up the development and reduced the number of errors/LOC. The benefits of the infrastructure provided by the J2EE platform-based server were crucial to deliver the level of service required to handle more than 40 thousand scheduling operations per day. Using a standard-based architecture, such as J2EE, it was possible to make the software developed for São Paulo available, as free software, to the rest of the public sector in the country. Design Engineers: Beatriz de Faria Leao, Fabiane Bizinella Nardon, Andre Piza, Rogerio Gatto, Lincoln Moura Jr.

ECOCEAN Whale Shark Photo-Identification Library

Company: ECOCEAN
Location: Portland, OR
Java: J2EE 1.3, JDO 1.01
URL: http://photoid.whaleshark.org

Description: The ECOCEAN Whale Shark Photo-identification Library is a first in the field of mark-recapture studies for wildlife population management. The Library is a visual database of whale shark (Rhincodon typus) encounters and of individually cataloged whale sharks. The Library is used by biologists and conservationists to collect and analyze whale shark data to learn more about these very rare 'gentle giants'. The difficulty involved in studying whale sharks requires a cooperative approach to data collection. J2EE and JDO fit the requirements of the project perfectly. Using J2EE and Struts, Jason Holmberg (application designer) and Brad Norman (marine biologist) created a web-based application to collect and share photographs and data from tourists and researchers worldwide. Using tag libraries from Sunwest Technologies, dynamic image management and copyright protection ensured the security of the images submitted. Using JDO 1.01 on the backend enabled rapid, object-oriented persistence

and development, allowing the Library to begin collecting data in April 2003 within four months of the first line of code! A very unique use of servlet-applet communication allowed Zaven Arzoumanian (NASA Astronomer) to modify an existing algorithm for photographic star matching to create a revolutionary spot pattern matching algorithm that allows whale sharks to be identified using only natural patterns extracted from photographs of their skin. Like a human fingerprint, this novel approach has yielded over 100 previously unknown matches of the same shark from photographs taken years apart. Java's ability to enable client-server communication permits fast pattern matching while allowing processor-intensive operations to be shifted down to local clients running applets. Java sits at the core of the ECOCEAN Library, and it promises to allow this feature-rich application to grow as our understanding of whale sharks grows through consistent and cooperative data collection and analysis.

DEVICE CATEGORY

i-mode FeliCa Mobile Wallet service

Company: NTT DoCoMo
Location: Japan
Java: J2ME CLDC
URL: http://www.imodestrategy.com/2005/02/
http://www.nttdocomo.com/corebiz/interconnected/felicaContent.html

In July 2004, Japan's NTT DoCoMo took consumer convenience to a new level with the launch of the i-mode FeliCa [tm] Mobile Wallet service. Enhanced by Java technology-based applications, i-mode FeliCa allows users to replace their cash, cards and house key with a FeliCa contactless IC chip in their phone. As of February 12 of 2005, more than 2 million i-mode FeliCa handsets have been sold.

The i-mode FeliCa chip is accessible only via Java-based i-applications. DoCoMo provides the application interface which utilizes J2ME CLDC technologies. Java is chosen as the underlying platform for i-mode FeliCa due to its inherent security model, which enables safe computing involving user-sensitive information. The usage of API sets are written in the contents developer guide for DoJa 3.0 i-appli option and enhancements.

EMERGING TECHNOLOGY CATEGORY

GE Healthcare Products

Company: GE Healthcare
Location: na
Java: J2SE, J2ME, Jini
URL: http://www.gehealthcare.com/usen/index.html

Description: GE Healthcare is a world-leader in patient monitoring systems, medical
imaging, healthcare information technologies, medical diagnostics, disease

research, drug discovery and biopharmaceuticals. GE Healthcare collectively leverages its leadership position in all aspects of the healthcare space to drive innovation that is shaping a new age of patient care. Java is a key enabler for the innovation behind a variety of commercially available products, including Unity Network IS Patient Viewer, which provides a near-real-time remote view of physiological data such as ECG, Blood Pressure, and Temperatue. While making rounds, sitting in meetings, or checking in from home, clinicians can use a web browser to remotely access their patient's vital data providing faster access to patient information where and when they need it. Patient
Viewer was architected using Jini, Swing, and Java Web Start.

ScanEagle Autonomous Navigation of Unmanned Air Vehicle

Company: The Boeing Company
Location: Saint Louis, MO
Java: J2SE 1.4.2, RTSJ 1.0
URL: http://www.boeing.com/defense-space/military/unmanned/scaneagle.html

Description: Boeing and leading universities in Real-Time Java technology recently demonstrated autonomous navigation capabilities on an Unmanned Air Vehicle (UAV) known as the ScanEagle. The ScanEagle is a low-cost, long-endurance UAV developed by Boeing and the Insitu Group. This UAV is four-feet long, has a 10-foot wingspan, and can remain in the air for more than 15 hours. The primary use of the ScanEagle vehicle is to loiter over trouble spots and provide intelligence, surveillance and reconnaissance (ISR) data. During a resent research flight demonstration, the Boeing Company used Real-Time Java technologies to enhance the performance of the ScanEagle. A payload board, inserted into the avionics bay and programmed in Real-Time Java, provided autonomous route planning and navigation of the ScanEagle UAV during threat observation, battle damage assessment, and offset stare from no fly zone during missile launches. At present, a ground station operator must perform these operations. This technology demonstrated is being developed as part of the Defense Advance Research Projects Agency's Program Composition for Embedded Systems program. The program, which is investigating Real-Time Java technologies, receives technical direction from the U.S. Air Force Research Laboratory. Contributions from leading universities include Purdue Universities Open Virtual Machine, Kansas State University Cadena Modeling Tool, Washington University Event Channel, and the University of California, Irvine, Zen Real-Time Java CORBA implementation. Phantom Works, the advanced research unit and catalyst of innovation for the Boeing enterprise, is assisting in ScanEagle's development. It provides leading edge systems and technology solutions to Boeing Integrated Defense Systems.

GigaSpaces Enterprise Application Grid

Company: GigaSpaces, Inc.
Location: San Francisco, CA
Java: Jini/JavaSpaces, JMS, JDBC, JNDI, RMI, JDO, J2SE 1.4.x / 5.0

The Enterprise Application Grid is an innovative implementation of distributed shared memory (based on Jini/JavaSpaces) allowing Java applications to run over a fully distributed grid of resources hardware and network. On top of this distributed shared memory the platform offers JMS messaging, JDBC querying over in memory data, and distributed parallel processing as well as advanced and uniquely fast and reliable caching and clustering. The platform also offers powerful management and configuration tools that help developers and administrators manage distributed processes and modules in real-time. In short, the Enterprise Application Grid takes Enterprise Java applications into the future of computing allowing them to harness a virtually unlimited set of resources dynamically and easily - making them more performant, scalable and reliable.

GAMING

[reviewed by Chris Melissinos]

Puzzle Pirates

Company: Three Rings Design, Inc.
Location: San Francisco, CA
Java:
URL: http://puzzlepirates.ubi.com/
Ye Features: http://www.puzzlepirates.com/about/features.html
Ye Press: http://www.puzzlepirates.com/about/press/

Description: Three Rings is an internet games development company founded on 2001 in San Francisco, California. Thei flagship project is Yohoho! Puzzle PiratesTM, a persistent world of Piracy based on Puzzle games. Written entirely in Java, both client and server, Yohoho! Puzzle Pirates is an online game in which you play a Pirate character in an ocean world. Hundreds of your fellow player Pirates swarm these Isles and Sea-lanes. For Pirates who love acronyms, Puzzle Pirates is an massively multi-player online roleplaying game, or mmoarrrrpg.

Pirates can wander around on land and sail the thirty-seven seas with their crew. When your Pirate sails, or swordfights, or navigates, the appropriate Puzzle game is launched. Good Puzzling thereby brings victories and accrues great fortunes to you and your fellow Pirates. Thus Yohoho! brings you Puzzling fun in a social Piratical setting, where every Puzzle game contributes to the greater story of your Pirate, her Crew, and the Ocean world.

LOOKING GLASS CATEGORY

Cosmo Scheduler D

Company: Kyushu Institute of Technology
Location: Fukuoka, Japan
Java: Looking Glass, Java3D, JDK 5.0
URL: http://k-www.mickey.ai.kyutech.ac.jp/cosmo/index_e.html

Description: Cosmo Scheduler D is a three-dimensional application running on Looking Glass (lg3d). You can use it as your schedule book which recalls the outer space. You have your personal solar system in this software. Cosmo Scheduler D arranges the solar system planets according to their dates. The front of the orbit represents the current time. The size of the planet means the importance of the plan, so you would never forget a plan in the distant future by Cosmo Scheduler D. Satellites going around a planet mean files which relate with the plan. Cosmo Scheduler D has a lot of features that an ordinary schedule notebook does not have. They are functions of automatic scheduling, networking and workspace manager. Cosmo Scheduler D has been designed and implemented by Yakushiji, Minamisako, Maeda and Koide. It targets at everyone including people who are interested in three-dimensional software. This software development is supported by Information-Technology Promotion Agency, Japan.

APPENDIX

2004 DUKE'S CHOICE AWARDS

1. 8D Technologies Automated Parking Management System (with 8D Eco Blue Box
2. Brazilian Secretary of Federal Revenue
3. SK Telecom Moneta M-Commerce Solution
4. Avis Assist/Motorola
5. Slooh.com
6. eBay
7. Orbitz
8. JPL Maestro
9. Agitator & the Agitar Management Dashboard
10. Techland Chrome multiplayer PC game

2003 DUKE'S CHOICE AWARDS

1. Mars Rover
2. NYPD
3. Getty Museum
4. nhl.com
5. HBO
6. Pogo.com
7. Java Card & Sun Ray
8. Thor Norbye
9. Brazil Medical System
10. JENTRO
11. University of Calgary, Visualization Cave
12. Nokia 6800