



Projects Day

JUNE 1, 2001

Science and Engineering Project Center
Senior Design Projects 2000-2001

WELCOME



This is the fourteenth year of the Science and Engineering Project Center. I congratulate all those within the School and outside for making this Project Center the success it is today. Welcome, all of you, and thank you for your participation.

On this, Projects Day 2001, we present the results of student work sponsored by industry, government, and other agencies, and developed by senior students in the science and engineering design program at Seattle University. This is a wonderful opportunity for our students to share with you the results of their hard work.

We are grateful to our sponsors – those who are veterans at sponsoring our projects and those who are new this year. It is a tribute to your faith in our students, and in the quality of their work, that you choose to invest your time and resources in these projects.

This senior capstone experience is perhaps the most important learning experience for our students in culminating their careers at Seattle University. Working in small groups, solving open-ended problems that may not have a unique solution, and being responsible to strict timelines, budgets, and the needs of outside agencies, are excellent preparations for the professional positions our students will soon fill.

Congratulations to our faculty, students, and professional mentors for bringing these challenging projects to fruition and to success.

George Simmons, Dean
School of Science and Engineering



On behalf of our faculty and students, I also welcome you to Projects Day 2001, our annual presentation of design team results to sponsoring organizations, visitors, and friends. I am grateful for the encouragement and assistance provided by our Science and Engineering Advisory Board and the Project Center Advisory Committee in promoting the external sponsorship of our projects. I would also like to acknowledge the coordination efforts of professors Rolf Skrinde in Civil and Environmental Engineering, Al Moser in Electrical Engineering, Teodora Rutar Shuman in Mechanical Engineering, Everaldo Mills in Computer Science, as well as Sheridan Botts, contracts manager, and Kathy Fletcher and Jim Austin, administrative assistants for the Project Center.

Special thanks go to the students in our engineering organizations who are your hosts today and who volunteer to carry out many of the tasks associated with our Projects Day celebration. These student societies are the American Society of Civil Engineers (ASCE), American Society of Mechanical Engineers (ASME), Institute of Electrical and Electronics Engineers (IEEE), National Society of Black Engineers (NSBE), Society of Environmental Engineers and Scientists (SEES), Society of Women Engineers (SWE), and Tau Beta Pi.

Patricia D. Daniels, Director
Science and Engineering Project Center

SCHEDULE

9:00 A.M. LEMIEUX LIBRARY FOYER

Projects Day Registration, project displays

9:15 A.M. – 10:45 A.M. SCHAFFER AUDITORIUM

ALSTOM ESCA Corporation

ATL Ultrasound

Vopak USA Inc.

US Coast Guard

Harris Group Inc.

SCADA Management Platform Relay Interface

Prediction of Scanhead Surface Temperatures

Pipeline Pigging to Clean Small Diameter Lines

Alternative Power for Remote USCG Stations

Fuel Recovery from Wastewater Treatment

10:45 A.M.

Break

11:00 A.M. – 12:30 P.M. SCHAFFER AUDITORIUM

Seattle Public Utilities

Sound Transit

WSDOT/VOW

AT&T Wireless Services

Better Lifestyles, Inc.

Haller Lake Drainage Improvements

Conceptual Design of Capitol Hill Light Rail Station

Iron Goat Scenic Trailhead and Rest Area

Mobile Load Test Bank

Automatic Switching for Toilet Bowl Exhaust System

11:00 A.M. – 12:30 P.M. STIMSON ROOM

Pratt & Whitney

Boeing, Commercial Airplanes

Amazon.com

Boeing, Phantom Works

Cybergroup/Children's Hospital

Flow Visualization in Pulse Detonation Engines

Pilot Control Test System

Amazon Knowledge Network

Quick Look Processor

Dreamsurfer Network

12:30 P.M. LEMIEUX LIBRARY FOYER

Buffet Lunch

1:30 P.M. – 3:30 P.M. SCHAFFER AUDITORIUM

ELDEC Corporation

Honeywell

Kenworth Truck Company

Medtronic Physio-Control

Siemens Medical Systems, Inc.

Thermal Test Monitor Software

High Speed Data Stream Format Converter

Interface to Fingerprint Identification Sensor

Smart Test Load for Defibrillators

Ultrasound Scan Processing

1:30 P.M. – 3:00 P.M. STIMSON ROOM

Engineered Software, Inc.

PNNL – Battelle

WISDM Corporation

Project Magnus

Metadata Viewer and Editor

WISDM Requirements Software

SCHAFFER AUDITORIUM MORNING

PROJECT NUMBER: CSSE 01.1
PROJECT TITLE: SCADA Management Platform Relay Interface
SPONSOR: ALSTOM ESCA Corporation
SPONSOR LIAISONS: Rob St. Andre, Emmanuel Pinault
FACULTY ADVISOR: Prof. Barbara Endicott-Popovsky
STUDENTS: Ryan Bass, Carson Cook, Kevin Chien-Pang Lin, Ahlee Ly, Khue Vu

ALSTOM ESCA is a company specializing in real-time control systems for electric utilities. They wanted an improved way to move data from power system relays into their Supervisory Control and Data Acquisition (SCADA) Management Platform (SMP) database and to allow relay engineers and technicians easy and efficient access to that data. The team developed the RelayBridge application to bring data from a relay to the SMP database, and the WebBridge application to allow web browser access to that data. The legacy system required a technician to individually dial into every relay in their system to retrieve its data. The new system allows easy web access to data from all of the relays in the system at once.

PROJECT NUMBER: EE 01.2
PROJECT TITLE: Prediction and Measurement of Scanhead Surface Temperatures
SPONSOR: ATL Ultrasound
SPONSOR LIAISONS: Kurt Sandstrom, Kevin Lantz
FACULTY ADVISOR: Prof. Alvin Moser
STUDENTS: Surtiono Darmanto, Nicci Dehuff, Lisa Louie, Joseph Tynan

For safety concerns of the patient and FDA regulations, the surface of an ultrasound scanhead must not exceed 41°C when in contact with the patient's skin. ATL Ultrasound desires to improve its existing temperature testing which measures the conditions of the scanhead as it approaches 41°C. Current thermal testing is excessively time-consuming and not cost effective. ATL Ultrasound asked the team to develop a method to predict surface temperatures of ultrasound scanheads based on various conditions of the pulse patterns sent to the scanhead. The team analyzed different methods of curve fitting using reference data of past temperature measurements and developed an algorithm to accurately predict surface temperature using the unique characteristics and variables of each discrete transmit pattern.

PROJECT NUMBER: CEE 01.4
PROJECT TITLE: Pipeline Pigging for Cleaning of Small Diameter Chemical Distribution Lines
SPONSOR: Vopak USA Inc.
SPONSOR LIAISON: Paul Camera
FACULTY ADVISOR: Prof. Rolf Skrinde
STUDENTS: Puna Lovell, Justin Rygel, Brian Worthington

Vopak uses small diameter pipelines and hoses at its chemical distribution centers nationwide. They must clean these pipelines so that various chemical products can be transported sequentially through the same lines with a minimum of product contamination. Vopak asked the team to adapt the technology of pipeline pigging, a physical/mechanical cleaning method, to clean the lines. The team evaluated various pigs and launching and receiving systems. Pig launching and trap design guidance notes and cost estimates provided by the team will be used by Vopak to construct appropriate equipment for the various distribution centers. The team then developed a pigging procedures manual for distribution center operators.

PROJECT NUMBER: MME 01.3
PROJECT TITLE: Alternative Power for Remote USCG Communication Stations
SPONSOR: United States Coast Guard
SPONSOR LIAISON: Debra Chinn
FACULTY ADVISOR: Prof. Teodora Rutar Shuman
STUDENTS: Kwok Tung Chan, Garrett Clayton, Indra Nursewan, Sonya Red Elk

The United States Coast Guard is responsible for maintaining numerous electrical generating power systems in the support of providing safety at sea. The Coast Guard operates diverse power systems ranging from lighted buoys powered by car batteries and solar panels, to radio receiving/rebroadcasting antennas using commercial power, to one megawatt electronic navigation systems (LORAN) utilizing diesel generators. Most generators, in particular, are characterized as inefficient, environmentally unfriendly, and aging. Because of this, the USCG has requested that the team conduct a feasibility study on alternative power technologies. The technologies considered include fuel cells, wind turbines, wave generators, photovoltaic and geothermal systems. The study includes research, technical requirements, vendor information, economic analysis, environmental concerns, as well as the feasibility of implementing the technologies over the next 15 years. A computer program was developed to aid the USCG in deciding which technology best suits a given application. The project deliverables will support the goal of powering all USCG communication stations with environmentally friendly generators.

PROJECT NUMBER: CEE 01.1
PROJECT TITLE: Fuel Recovery from Wastewater Treatment
SPONSOR: Harris Group Inc.
SPONSOR LIAISONS: John Lukas, Andrea Slayton
FACULTY ADVISOR: Prof. Phillip Thompson
STUDENTS: Christina Avolio, Sheri Lott, Donald Tillman

The Harris Group has developed a solid waste facility that will convert municipal solid waste into fuel-grade ethanol and carbon dioxide through a concentrated acid hydrolysis-fermentation process. The high-strength industrial wastewater leaving the fermentation process must be treated prior to being discharged to the city's wastewater treatment plant. The team recommended a methane-generating anaerobic treatment technology for the wastewater and has performed a cost/benefit analysis for the process. This team also evaluated the potential toxicity of heavy metals present in the ethanol fermentation waste stream to the anaerobic treatment process and found that the expected concentrations of copper (II), chromium (III), zinc and nickel will not inhibit methane production.

SCHAFFER AUDITORIUM AFTER MORNING BREAK

PROJECT NUMBER: CEE 01.2
PROJECT TITLE: Haller Lake Drainage Improvements
SPONSOR: Seattle Public Utilities
SPONSOR LIAISONS: Dr. Darla Inglis, Beth Schmoyer
FACULTY ADVISOR: Prof. Jean Jacoby
STUDENTS: Stephen Bentsen, Benjamin Marre, Shannon Nobel, Metra Angelica Sadri

Seattle Public Utilities (SPU) is responsible for the management of city-owned storm drains throughout Seattle's city limits. The Meridian Avenue North storm drain, which empties into Haller Lake, is a public drain that falls within SPU's jurisdiction. Recently, citizens of the Haller Lake community have voiced concern that urban stormwater runoff has degraded Haller Lake's water quality. SPU has acknowledged these concerns and wishes to assess and correct the possible contamination to ensure the water quality of the lake. SPU asked the team to monitor the stormwater entering Haller Lake via the Meridian Avenue North storm drain and identify stormwater contaminants. Based on the monitoring data, a preliminary engineering analysis was conducted and a stormwater treatment system was designed to achieve the best possible reduction in targeted contaminants. The system was designed according to the Washington State Department of Ecology's and the City of Seattle's stormwater guidelines.

PROJECT NUMBER: CEE 01.3
PROJECT TITLE: Conceptual Design of the Capitol Hill Light Rail Station
SPONSOR: Sound Transit
SPONSOR LIAISONS: Isam Awad, James Weber
FACULTY ADVISOR: Prof. Nirmala Gnanapragasam, Prof. Richard Schwaegler
STUDENTS: Kevin Houck, Brian Labrecque, Mi-Hyun Lee, Johnathan Pang

The Puget Sound region has an increasing need for rapid transit. Thus, Sound Transit is planning to construct a light rail system, the Link Light Rail, which will run from the University District to SeaTac airport. Due to public sentiment and the rising costs, Sound Transit decided to move the Capitol Hill Station from East Broadway Street to Nagle Place, one block to the east. The objective of the design team was to carry out a preliminary engineering study and develop a conceptual design for the new station. The design team studied the vicinity around Nagle Place and decided on the best location for the station. In deciding the station location, several major concerns were addressed. The underground utilities in the area were located and strategies were developed to either protect or relocate these utilities. Limited geotechnical and structural issues were addressed. The environmental impacts on the surrounding community were studied. The team then developed a conceptual design of the station and submitted its recommendations to Sound Transit along with a set of preliminary drawings of the station.

PROJECT NUMBER: CEE 01.5
PROJECT TITLE: Iron Goat Scenic Trailhead and Rest Area
SPONSOR: Washington State Department of Transportation (WSDOT) and Volunteers for Outdoor Washington (VOW)
SPONSOR LIAISON: David Honsinger, Penny Heager, Ruth Ittner
FACULTY ADVISOR: Prof. Mark Siegenthaler
STUDENTS: Ghulam Abbas, Benjamin Barlow, Michaela Kozak, Michael Tamola

The Iron Goat Trail is an accessible hiking trail located on the abandoned Great Northern Railroad grade in the Stevens Pass Historic District. Volunteers for Outdoor Washington and the Mt. Baker-Snoqualmie National Forest, in conjunction with the Washington State Department of Transportation, seek to provide a trailhead and rest area access from U.S. Highway 2 near Scenic, Washington. The team prepared design plans, specifications, cost estimates and a design report as an integral part of a funding proposal for a U.S. Federal Highway Administration National Scenic Byway Grant. The design provides an aesthetically pleasing, barrier-free trail access and rest area for visitors that enhances the historic and environmental attributes of the site. The facility includes an access road and parking for 60 vehicles, vault-toilet restrooms, picnic tables, solar-power lighting, an information kiosk, stormwater detention and water quality mitigation, and additional amenities.

PROJECT NUMBER: EE 01.1
PROJECT TITLE: Mobile Load Test Bank
SPONSOR: AT&T Wireless Services, Technology Development Group
SPONSOR LIAISON: Ian King
FACULTY ADVISOR: Prof. Bert Otten, S.J.
STUDENTS: Ibrahim Al-Kholyifi, Yannick Chungue, Steven Gusenius, Chad Miyamoto, Steven Troy

AT&T Wireless Services wants to develop a working prototype of a load bank suitable for use with its test systems. Designing such a system allows AT&T Wireless Services to improve the quality of services and increase customer satisfaction. To achieve this, AT&T Wireless Services asked the team to plan, design, and develop a device that will incorporate multiple cellular modules in order to provide mobile phone signals to test one or more of their radio-based network elements. The project team researched and designed a multiple-unit test bank, which includes a case, terminal server, power supply, printed circuit boards, and phone modules as its major elements. Team members considered electrical, thermal, and radio isolation concerns throughout the design process.

PROJECT NUMBER: EE 01.3
PROJECT TITLE: Automatic Switching Circuit for Toilet Bowl Exhaust System
SPONSOR: Better Lifestyles, Inc.
SPONSOR LIAISON: Britt Cardwell
FACULTY ADVISOR: Prof. Xusheng Chen
STUDENTS: Farzad Keshvadian, Dipin Jain, Christian LeRoy-Hernandez, Won Lee

Better Lifestyles developed a manually operated toilet bowl exhaust system to eliminate odors and reduce airborne microbes. They asked the team to automate this system. The team designed, tested, and put into operation an automatic switching circuit to operate the exhaust system vacuum motor. The switching circuit operates the motor at 60 volts AC when a user is present, and up to 120 volts AC for one minute during the flush cycle to capture airborne microbes. In addition, the team equipped the vacuum motor with a moisture detection switch to shut down the motor if the toilet bowl overflows.

STIMSON ROOM AFTER MORNING BREAK

PROJECT NUMBER: MME01.1
PROJECT TITLE: Flow Visualization in Pulse Detonation Engines
SPONSOR: Pratt & Whitney Seattle Aerosciences Center
SPONSOR LIAISON: Scott Henderson
FACULTY ADVISOR: Prof. Ananda Cousins
STUDENTS: Ben Hales, Justin Pierce, Michelle Taht, Brandon Viernes

The Pratt & Whitney Aerosciences Center in Bellevue, WA, is currently testing a prototype pulse detonation engine. Unlike conventional rocket propulsion engines, which operate on a continuous fuel burn process, pulse detonation engines operate in cycles. A fuel/air mixture is injected into the combustion chamber where detonation is initiated with a spark. The high-speed detonation results in very high pressures and temperatures that force exhaust from the chamber, providing thrust. Pulse detonation engines are currently being tested for use in military, space and power generation applications. Pratt & Whitney asked the team to design and build a non-intrusive optical system capable of providing images of combustion/pressure waves and fuel/air detonation processes based on differences in fluid density inside the combustion chamber. The team designed and constructed a focusing schlieren optical system capable of providing these photos. These images will complement the readings obtained with pressure transducers and thermocouples that measure combustion/pressure wave motion and the fuel/air detonation process inside the combustion chamber. The information from the schlieren system will help to increase the overall efficiency of Pratt & Whitney's pulse detonation engine.

PROJECT NUMBER: MME 01.2
PROJECT TITLE: Pilot Control Test System
SPONSOR: The Boeing Company, Commercial Airplanes Group
SPONSOR LIAISON: Dan Cartmell
FACULTY ADVISOR: Prof. Greg Mason, Prof. Pierre Gehlen
STUDENTS: Ethan Albright, Britta Fehst, Jeff Gould, Sondre Moerkeseth, Casey Olson

The Boeing Commercial Airplanes Group designs and builds flight simulators to train pilots. A pilot uses the aircraft's control column to vary the aircraft's pitch. Accurate tactile response of the column in a flight simulator is necessary to achieve the high degree of realism required for pilot training. The team developed a specialized test device capable of automatically driving the control column in a repeatable manner, with a known force profile, while measuring and recording the positional response of the column. The test device is relatively lightweight and portable, and designed so that it can be quickly and easily installed in the flight deck of either a flight simulator or an aircraft. The test device will be used primarily to verify the accuracy of the column response in flight simulators, but may also be used to collect data from real aircraft to validate and refine existing flight simulator pilot control models.

PROJECT NUMBER: CSSE 01.2
PROJECT TITLE: Amazon Knowledge Network
SPONSOR: Amazon.com
SPONSOR LIAISONS: Garrett Stokes, Nick White
FACULTY ADVISOR: Prof. Barbara Endicott-Popovsky
STUDENTS: Jin Moon, Trung Le, Tinggar Kovara, Marc Lorenz, Bronson Shelton

In recent years, many companies have leveraged the Internet to further educate their employees. Amazon.com has developed a web-based application, together with the Saba Learning Enterprise, to provide online training content to its employees. In the first phase of this project, the team improved the functionality, user interface, and theme of the application. In the second phase, they developed and implemented a testing template. The template utilized Macromedia's Dreamweaver

4 and an AICC compliant testing format and reported data to an Oracle database using ODBC. In the third phase of the project, they modified and developed reports using Crystal Reports Developer. These reports convey vital data to the appropriate user in a flexible and comprehensive manner. Then the team tested and integrated all of the development changes into the Amazon.com production environment. They also provided information documenting the modifications and additions to the application.

PROJECT NUMBER: CSSE 01.3
PROJECT TITLE: Quick Look Processor
SPONSOR: The Boeing Company, Phantom Works
SPONSOR LIAISON: Dale Karr
FACULTY ADVISOR: Prof. Mitchell Spector
STUDENTS: Hsin-yi Berg, Chan Chaiyochlarb, Kevin Cheung, Gabe Ingram, Colin Thorgerson.

Boeing's Phantomworks creates hardware and software products for military use. The Quick Look Processor is a visualization and testing tool for the "Single Integrated Air Picture," which combines data from several radar sites to create a unified air picture. The team was asked to convert Boeing's previous Quick Look Processor from the language Tcl to Java, as well as enhancing its data collecting and recording abilities. The improved system gives Boeing greater power, flexibility, and extensibility in the Quick Look Processor.

PROJECT NUMBER: CSSE 01.4
PROJECT TITLE: Dreamsurfer Network
SPONSOR: Cybergroup, Inc. and Children's Hospital
SPONSOR LIAISONS: Greg Bean, Andrea Everton, Bonnie Shultz
FACULTY ADVISOR: Prof. Susan Reeder
STUDENTS: Tanna Giroux, Brandon Loo, Roy Mamuad, Margaret Streckenbach, Matt Vahlsing

Dreamsurfer Network's mission is to help develop and nurture hospital based support groups for seriously ill adolescents through an interactive and innovative Web site. The Dreamsurfer Network currently links support groups throughout the United States in an encouraging, confidential, counselor supervised setting. The team modeled the Dreamsurfer desktop site and linked the current tools to a site accessible via handheld devices. This allows mobile access for teens confined to hospital beds or without desktop computer access. With the guidance of Cybergroup, a copy of the network was transferred to Seattle and alterations to the site were made. The product was taken for testing to the Dreamsurfer teens at Children's Hospital in Seattle, and the wireless site was transferred back to Cybergroup to be implemented alongside the desktop network.

SCHAFFER AUDITORIUM AFTERNOON

PROJECT NUMBER: EE 01.4
PROJECT TITLE: Thermal Test Monitor Software
SPONSOR: ELDEC Corporation
SPONSOR LIAISONS: George Pavlakos, Andrew Siguenza
FACULTY ADVISOR: Prof. Paul Neudorfer
STUDENTS: Himanshu Shekhar, Kari Stromsland, Cindy Tran, Chris Roberts

Because of critical safety concerns in the aviation industry, ELDEC thoroughly tests all of its products under a wide range of environmental conditions. The current test station for temperature and vibration has a controller based on the DOS operating system that continues to run even after a unit under test (UUT) failure. There is no automated test failure notification to a technician. The objective of this project was to improve the efficiency and reduce the cost of ELDEC's thermal test operations. The team used C++ and LabVIEW on a Windows NT workstation to design a top-level software. Thorough testing demonstrated that this software will perform a controlled shutdown of the thermal chamber and notify a technician via a pager when a test fails.

PROJECT NUMBER: EE 01.5
PROJECT TITLE: High Speed Data Stream Format Converter
SPONSOR: Honeywell
SPONSOR LIAISONS: Wendell Frost, Tehmosp Khan
FACULTY ADVISOR: Prof. Viet Tran, S.J.
STUDENTS: Ahmed Al-Faresi, Anneka Beatty, Marce Montano, Joe Slepiski

Aircraft use various data formats to transmit information to the black box data recorders. Honeywell needed a means to convert a data stream from one format to another. The team designed and built a circuit to convert a digital, serial 12-bit data stream ARINC (Aeronautical Radio Incorporation) 573/717 into a digital 32-bit ARINC 429 data stream. The 429 word contains the original 573/717 word, with the addition of other information. The team used VHDL code to program a chip to do the conversion.

PROJECT NUMBER: EE 01.6
PROJECT TITLE: Interface to Fingerprint Identification Sensor
SPONSOR: Kenworth Truck Company
SPONSOR LIAISON: Ted Scherzinger
FACULTY ADVISOR: Prof. Bert Otten, S.J.
STUDENTS: Val Guignon, Eric Jackson, Mark Tamola, Svet Villariasa

Each year, clients of Kenworth Truck Company report high turnover rates of truck driver employees, with many companies averaging nearly 100%. As a result, problems arise when drivers and vehicles must be reassigned since locks and keys to the trucks must be duplicated each time. Moreover, security becomes an issue if old drivers fail to return their keys. Kenworth wishes to address these concerns by replacing the traditional "lock and key" system in their T2000 truck line with a fingerprint verification system based on the MV1100 fingerprint identification sensor by Biometrics. The objective of this project was to implement the interface between the fingerprint sensor and the truck's control system. After considering different alternatives, the final design consisted of an LCD/keypad user interface based on the Motorola 6811 microprocessor. This design choice produced a simple, user-friendly, expandable and programmable interface with the identification sensor.

PROJECT NUMBER: EE 01.7
PROJECT TITLE: Smart Test Load for Defibrillators: Design and Testing
SPONSOR: Medtronic Physio-Control
SPONSOR LIAISON: Scott Eby
FACULTY ADVISOR: Prof. Robert Heeren
STUDENTS: Wyatt Erickson, Josey Sandoval, Eleazar Santos, Scott Wolf

Medtronic Physio-Control specializes in the design and manufacture of accurate cardiac tools that help save lives. The company currently manufactures a line of defibrillators that produce a new pulse waveform, which the current test load does not monitor accurately. The company asked the team to redesign the test load to more accurately monitor the new pulse waveform. The team redesigned the circuit using non-inductive low tolerance resistors and high accuracy instrumentation amplifiers. The new test load design produces an accurate representation of the new pulse waveform and also a better low frequency response for the old waveform.

PROJECT NUMBER: EE 01.8
PROJECT TITLE: Ultrasound Scan Processing
SPONSOR: Siemens Medical Systems, Inc., Ultrasound Group
SPONSOR LIAISON: Dr. Doug Hewett
FACULTY ADVISOR: Prof. Paul Neudorfer
STUDENTS: Emmanuel Elmido, Jason Nguyen, David Truong, Man Wong

Siemens Medical Systems is dedicated to improving the science of medicine through advances in diagnostic ultrasound. Siemens' ultrasound group seeks to develop an automated selection of specific filtering parameters for ultrasound transducer data using Matlab. Currently, Siemens manually determines the proper local oscillator frequency and bandwidth of the transducer's data. This is considered imprecise, inefficient and time consuming. The design team generated a Matlab program that automatically segments the transducer data, applies an FFT algorithm to generate a series of spectral representations, and selects the local oscillator frequency and the upper and lower frequencies of the bandwidth. The result of this algorithm can be used to create bandpass filters for the preprocessing of signals in Siemens Ultrasound instrumentation.

STIMSON ROOM AFTERNOON

PROJECT NUMBER: CSSE 01.5
PROJECT TITLE: Project Magnus
SPONSOR: Engineered Software, Inc.
SPONSOR LIAISON: Carolyn Popp
FACULTY ADVISOR: Prof. Adair Dingle
STUDENTS: Lily Chan, Yoshihira Kasagami, Arthur Kim, David Marshall, Souphaphone Sasouvanh

Engineered Software, Inc. produces applications used to design, analyze, and troubleshoot fluid piping systems. Their Pump-Flo application software relies on pump data provided by pump manufacturers. This critical information is typically calculated by hand and is a long, tedious, and error-prone process, often taking vendors many months to deliver. The team developed an interactive Windows-based application that automates the process of calculating test and family curves; displays the generated curve data; and stores the results to a database, which can then be exported to Engineered Software's Pump-Flo application. Automating this procedure saves the vendors much time and effort and also supplies Engineered Software with data in the form their application requires.

PROJECT NUMBER: CSSE 01.6
PROJECT TITLE: Metadata Viewer and Editor
SPONSOR: Pacific Northwest National Laboratory – Battelle
SPONSOR LIAISON: Dr. Judi Thomson
FACULTY ADVISOR: Prof. Gene Carpenter
STUDENTS: Katie McAlister, Dora Rozis, John Tea, Shen Wang, Kevin Watt

Pacific Northwest National Laboratory uses a hierarchical storage management system called SDME Explorer. A distributed client-server application, SDME Explorer runs in a mixed hardware, software, and networking environment. SDME Explorer provides scientists with the capabilities to access and view archive files and metadata describing the contents of the archive. However, the metadata must be viewed in an external editor in order to modify it, which is slow and time consuming. PNNL would like an application that will work in conjunction with SDME Explorer, allowing users to view, modify, and save the metadata in a more useable way. PNNL also requested that the application be able to run on multiple platforms and dynamically display the metadata. The project team researched various solutions for providing these extra capabilities and has concluded that Mozilla XPToolkit is best equipped to meet the demands of the problem. XPToolkit allows for the dynamic display of metadata content based upon a schema and can run on a wide variety of platforms.

PROJECT NUMBER: CSSE 01.7
PROJECT TITLE: WISDM Requirements Software
SPONSOR: WISDM Corporation
SPONSOR LIAISON: Blair Burner
FACULTY ADVISOR: Prof. Everaldo Mills
STUDENTS: Megan Dawson, Spring McBean, Keith Meier, Michael Selter, Dorsey Wilkin

The WISDM Corporation conducts workshops and provides specialized software for the development of requirement specifications. WISDM asked the team to design and develop the second release of their WISDM Requirements Software, Version 3.0. The team used Java SDK and an Oracle 8i database to develop Release 2 of the WISDM Requirements Software, Version 3.0. This solution provides the option of a web-based or stand-alone desktop application to aid WISDM workshop facilitators and their clients in the development of requirement specification documents.

SPONSORING ORGANIZATIONS AND LIAISONS

We want to acknowledge with special thanks the organizations that sponsored projects in 2000-2001, and especially the liaisons representing the sponsors, who worked with the students throughout the year. The time these liaison representatives spent in consultation with our teams is much appreciated by the students and their faculty advisers. It is the liaisons who provide the history and background of each project, its relationship to other work in the sponsoring organization, and much of the technical direction that makes a project successful.

ALSTOM ESCA Corporation, Emmanuel Pinault and Rob St. Andre

Amazon.com, Garrett Stokes and Nick White

AT&T Wireless Services, Ian King

ATL Ultrasound, Kevin Lantz and Kurt Sandstrom

Better Lifestyles, Inc., Britt Cardwell

The Boeing Company, Commercial Airplanes Group, Dan Cartmell

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Pacific Northwest National Laboratory – Battelle, Judi Thomson

Pratt & Whitney Seattle Aerosciences Center, Scott Henderson

Seattle Public Utilities, Darla Inglis and Beth Schmoyer

Siemens Medical Systems, Inc., Doug Hewett

Sound Transit, Isam Awad and Jim Weber

United States Coast Guard, Debra Chinn, Ed Smith, and Carl J. Uchytel

Vopak USA Inc., Paul Camera

Volunteers for Outdoor Washington/Iron Goat Trail, Ruth Ittner

Washington State Department of Transportation, Penny Heager and David Honsinger

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CIVIL AND ENVIRONMENTAL ENGINEERING

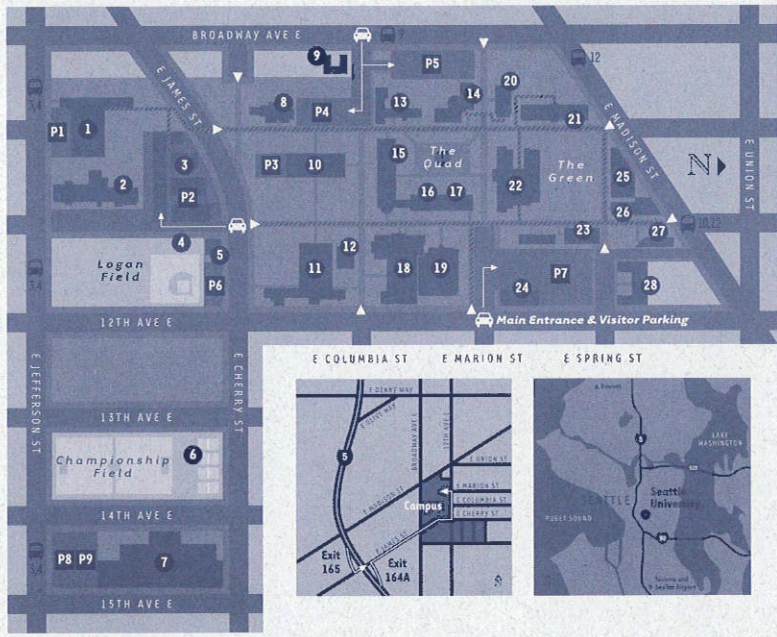
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Ms. Glynda J. Steiner, Seattle Public Utilities, City of Seattle
Mr. Stephen C. Wagner, Tetra Tech Infrastructure Northwest

ELECTRICAL ENGINEERING

- Dr. Frank D. Gorecki, The Boeing Company
Mr. Andrew Siguenza, ELDEC Corporation
Mr. Merv Smith-Casem, Siemens Medical Systems, Inc.
Mr. Mark Waechter, Quinton Instrument Company
Ms. Diane Wood, Terabeam

MECHANICAL ENGINEERING

- Dr. Dodd Grande, K2 Corporation, Chair
Ms. Rhonda Baresch, Wieland Lindgren and Associates, Inc.
Mr. Michael Haynes, HDR Engineering
Dr. Mostafa Rassaian, The Boeing Company
Ms. Cynthia M. Stong, The Boeing Company



▲ Campus Entry Point ♿ Accessible Route 🚊 King County Metro 🚗 Parking Entrance P9 Parking Area

- 21 Administration Building
- 19 Admissions Office
- 21 Alumni Office
- 3 Archbishop Murphy Apartments
- 8 Arrupe Jesuit Residence
- 14 Arts and Sciences
- 17 Bannan Biology Wing
- 16 Bannan Building
- 15 Bannan Center for Science and Engineering
- 11 Bellarmine Residence Hall
- 2 Bessie Burton Sullivan Skilled Nursing Residence
- 19 Book Store
- 22 Albers School of Business and Economics

- 1 Campion Residence Hall
- 24 Campus Services Building
- 14 Casey Building
- 23 Chapel of St. Ignatius
- 7 Connolly Center
- 21 Development Office
- 15 Engineering Building
- 4 Field House
- 25 Fine Arts Building
- 20 Garrard Building
- 19 Human Resources
- 6 International Student Center
- 10 Lemieux Library
- 13 Loyola Hall
- 27 Lynn Building

- 14 Matteo Ricci College
- 12 McGoldrick Center
- 22 Pigott Building
- 27 Institute of Public Service
- 22 Public Relations Office
- 13 School of Education
- 18 School of Law
- 20 School of Nursing
- 9 School of Theology and Ministry Annex
- 15 Science and Engineering
- 26 Student Union Building
- 18 Sullivan Hall
- 6 Tennis Courts and Facility
- 19 University Services Building
- 28 Xavier Residence Hall

P1 10th and E. Jefferson Lot F, S

P2 11th and E. Cherry Garage D, F, S, V

P3 10th and E. James Lot S

P4 10th and E. Columbia Lot D, J, S

P5 Broadway and E. Columbia Garage C, F

P6 12th and E. Cherry Lot S

P7 12th and E. Marion Lot C, D, S, V

P8 14th and E. Jefferson South Lot S

P9 14th and E. Jefferson North Lot F

C Carpool D Disabled F Faculty and Staff J Jesuit S Student V Visitor



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DIRECTIONS

Take the James Street exit off 1-5 (southbound exit #165, northbound exit #164A), continue east to Broadway. Turn left at the light on Broadway and north two blocks to East Columbia. Turn right onto East Columbia and immediately left into the Seattle University parking garage (P5). Request a parking permit from the attendant. Projects Day presentations are at the Lemieux Library (10).