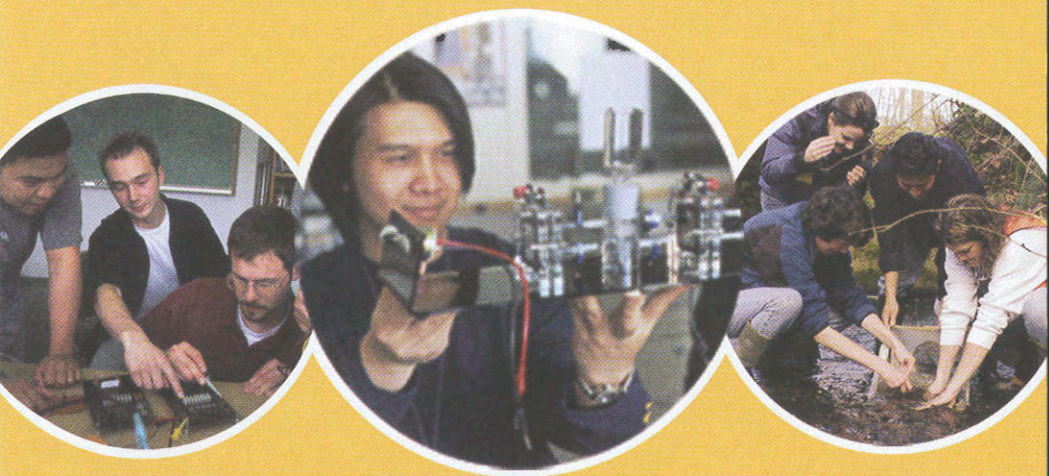


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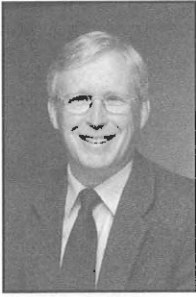
PROJECTS DAY

JUNE 6, 2008



SEATTLE UNIVERSITY

WELCOME FROM THE DEAN



Welcome to Projects Day 2008! For more than twenty years, the Project Center has provided our seniors the opportunity to work in teams, engage with external organizations, and apply the engineering skills they've learned at Seattle University. I want to acknowledge the project mentors and the faculty advisors who have worked with the teams throughout the academic year, helping them come to a deeper understanding of what it's like to solve "real-world" problems.

We are proud of our students and what they have accomplished. I encourage you to look through this program, identify some projects of interest, and attend the team presentations. If you have a question, fire away! I'm confident you'll be impressed with the quality of our graduates.

The Project Center is one of the jewels in the crown of the College of Science and Engineering. We are grateful to the corporate sponsors who make it possible for us to provide our students with this terrific educational experience. Thank you for your generous support!

Michael J. Quinn, Dean
College of Science and Engineering

WELCOME FROM THE PROJECT CENTER DIRECTOR



On behalf of our faculty and students, I wish you a warm welcome to Projects Day 2008, 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 also want to thank our sponsoring companies and organizations. Without the participation of these companies, our students would not be able to experience the growth that comes from working on real industry projects under the guidance of company liaisons. Thank you for your gift of time, wisdom, encouragement and guidance.

I would also like to acknowledge the coordination efforts of professors Nirmala Gnanapragasam in Civil and Environmental Engineering; Alvin Moser in Electrical and Computer Engineering; Greg Mason in Mechanical Engineering; William Poole in Computer Science and Software Engineering; Amy Haedt, Corporate Relations Manager; and Michael Mabie, Diannie Ran and Michael Smith, Administrative Assistants. I also want to thank Dean Kellye Testy and Associate Dean Richard Bird of the School of Law for allowing us to use Sullivan Hall for our function.

This is truly a day that can only happen when Seattle University and the larger community work together to support the scientists and engineers of tomorrow.

Jeff Gilles, Director
Science and Engineering Project Center

SCHEDULE

Projects Day Seattle University Sullivan Hall June 6, 2008

1:00 p.m.

Projects Day Registration and Project Displays

1:30 p.m.

Welcome, President Stephen Sundborg and Dean Michael Quinn

1:45 p.m.

First Undergraduate Concurrent Session

ME Teams

The Boeing Company
Puget Sound Energy

Room 109 *

Stowage Bin Counterbalance
Home Energy Kit

CSSE Teams

AREVA T&D
Nordstrom

Room 110 *

SCADATOP Rewrite
Online Procurement Tool

CEE Teams

Tetra Tech
Seattle City Light

Room C5

Nicaragua Coffee Beneficio
Diablo Hydroelectric Powerhouse

ECE Teams

The Boeing Company
The Boeing Company

Room C6

Automated Waste Flap Door
Starry Skies Ceiling Panels

2:30 p.m.

Graduate MSE Session

MSE Teams

The Boeing Company
Cisco Systems
ElderHealth
InSpa Corporation
Seattle University

Moot Courtroom

Virtual Flight Deck Simulator
Unity Product Enhancements
Time Tracking Reporting System
Business Analysis and Prediction System
Early Reliability Analysis

2:35 p.m.

Break (Undergraduate Session)

2:45 p.m.

Second Undergraduate Concurrent Session

* Please enter Rooms 109 and 110 from the rear of the classroom, down corridor between rooms.

SCHEDULE

ME/ECE Teams
Kenworth Truck Company
Seattle University
Kenworth Truck Company

CSSE Teams
WaMu
Zetec

CEE Teams
Snohomish County Public Works
Group Four Inc.
Tinnea & Associates, LLC

ECE Teams
PACCAR
Philips Healthcare
R Plus Consulting

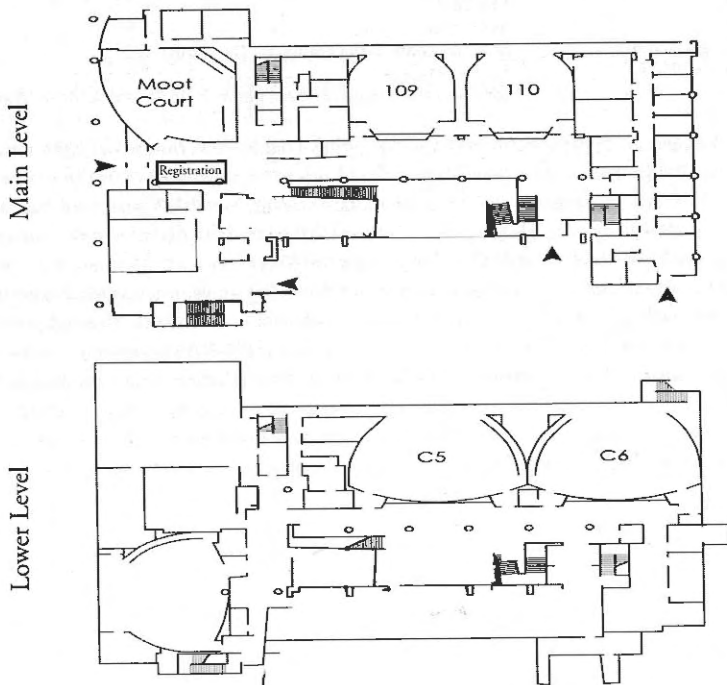
Room 109 *
Engine Exhaust Gas Heat Recovery
ASME Winrobo Competition
Energy Harvesting Device for Truck Exhaust

Room 110 *
Database Conversion Tool
Automated Calibration Standards

Room C5
Swamp Creek Bridge #546
Highland Terrace
High Resistivity Concrete Mix Design

Room C6
Onboard Vehicle Data Adapter
RFID Technology for Ultrasound
Game Auto-Shutoff

4:00 p.m.
Poster Session and Reception



CIVIL AND ENVIRONMENTAL ENGINEERING

TITLE: Highland Terrace Drainage Analysis
NUMBER: CEE 08.1
SPONSOR: Group Four Inc.
SPONSOR LIASON: Jeffrey Dye
FACULTY ADVISOR: Prof. Nirmala Gnanapragasam
STUDENTS: Richard Adams, Adam Alday, Jeremiah Bowles

Over the past 30 years, advances in technology, increased environmental awareness, and our understanding of storm water modeling have led to regulatory changes in King County. In order to better understand the impact these changes have had on the cost-per-unit of storm water treatment and the size of detention facilities, Group Four Inc. requested that the design team develop storm water solutions for the 7.33 acre, 25 unit Highland Terrace subdivision in Issaquah using four different modeling methods. Each method required significantly different environmental and regulatory considerations as dictated by the time period during which they were developed and employed. Consequently, the four resulting solutions represent the cost of storm water treatment and detention at four different periods in time. By comparing the current cost of constructing these four design solutions, a trend in storm water facilities cost over the past 30 years was determined. The analysis was conducted using the following methods: Yrjanainen and Warren (effective 1977-1992), Santa Barbara Urban Hydrograph (effective 1992-1998), KCRS (effective 1998-Present), and WWHM3 (effective 2001-Present). The team submitted the four storm water system designs and a comparison of detention volumes and unit cost of storm water treatment to Group Four Inc.

TITLE: Diablo Powerhouse Sediment Management Project
NUMBER: CEE 08.2
SPONSOR: Seattle City Light
SPONSOR LIAISONS: Scott McLean, Dan O'Sullivan, Dee Smiley
FACULTY ADVISOR: Prof. Wes Lauer
STUDENTS: Mathieu Marineau, Michael Peele, Kyle Smith, Andrew Tran

The power generating capacity of Seattle City Light's Diablo Powerhouse has been reduced in recent years by the growth of a gravel bar in the Skagit River downstream of the power plant. The gravel bar is located at the mouth of a tributary stream, Stetattle Creek, and has raised the water level in the power plant's tailrace by several feet, thereby decreasing the energy available for generating power. Seattle City Light seeks to restore lost hydroelectric capacity by reducing the size of the gravel bar. Alternatives for removing gravel include excavation and/or controlled flooding. The design team developed a hydraulic model of the affected portion of the Skagit River using the U.S Army Corps of Engineers HEC-RAS computer program. The model accounts for the movement of sediment during large releases using a built-in moveable bed sediment transport function. The effectiveness of three gravel removal alternatives was evaluated using the computer model. The findings of the project include a report of the design team's results and a cost/benefit analysis of alternatives for removing the gravel bar.

CIVIL AND ENVIRONMENTAL ENGINEERING

TITLE: Design of the Swamp Creek Bridge 546 Replacement
NUMBER: CEE 08.3
SPONSOR: Snohomish County Department of Public Works
SPONSOR LIAISONS: Brian Larmore, Lisa Wirt
FACULTY ADVISOR: Prof. Jeff Dragovich
STUDENTS: Edward DeBrock, Brandon Estrella, Matthew Hennessey, Ryan Tilley

Snohomish County Department of Public Works has identified Swamp Creek Bridge 546 as structurally deficient and in need of replacement. The County requires that the replacement superstructure be a single-span, pre-stressed concrete bridge. The design of the replacement structure was constrained by two major design challenges: a high pressure artesian aquifer located 48 feet below the road surface and a large scour depth. The substructure design solution incorporated a shallow pile foundation system to prevent penetration of the piles into the aquifer and sheet pile walls that provided containment of the soil behind the abutment in the event of scour during peak creek flows. Project deliverables included a full set of structural plans and details, specifications with special provisions, a construction sequence memo, a cost estimate, design calculations, and a final report.

TITLE: Ecological Coffee Beneficio in Nicaragua
NUMBER: CEE 08.4
SPONSOR: Tetra Tech
SPONSOR LIAISON: Grizelda Sarria
FACULTY ADVISORS: Prof. Mike Marsolek, Prof. Sue Jackels
STUDENTS: Joshua Alcantara, Patrick Cummings, Luis Quintero, Michael Wynne

Nicaragua has the third lowest per capita income in the western hemisphere, and small farmers operate approximately 80% of its 30,400 coffee farms. While these farms hold great promise for developing Nicaragua's economy, they also carry an environmental burden. The wastewater produced during coffee processing is acidic, low in dissolved oxygen, high in turbidity, and contains elevated concentrations of readily biodegradable organic matter (Biochemical Oxygen Demand or BOD). A Seattle based environmental engineering firm, Tetra Tech, requested the team to design and plan an ecological coffee "beneficio", or collective wet processing mill, with corresponding wastewater treatment for the small farm at La Suana, Nicaragua. This wastewater treatment will benefit five families and the downstream users of the water. The focus of the project is to implement an ecological design with cost-effective methods to efficiently treat the waste produced during coffee processing. The team evaluated several treatment options before selecting three primary alternatives. The alternatives were analyzed for performance, reliability, site constraints, capital and O&M costs, and social impact. Based on this analysis, a preferred alternative was selected for construction.

CIVIL AND ENVIRONMENTAL ENGINEERING

TITLE:	Very High Early Strength High Resistivity Concrete Mix Design
NUMBER:	CEE 08.5
SPONSOR:	Tinnea & Associates, LLC & Seattle Public Utilities
SPONSOR LIAISONS:	Jack Tinnea, Ryan Tinnea
FACULTY ADVISOR:	Prof. Katharine Kuder
STUDENTS:	Ryan Daudistel, Balkis Hassane, Christopher Stoll, Kari Ann Tomosada

The increase of light rail in the Seattle area has raised concern that stray currents from the rails will expedite corrosion in underground utilities. Seattle Public Utilities asked Tinnea & Associates, LLC along with the design team to develop a very high early strength, high resistivity concrete mix. Very high early strength is needed to reduce the duration of lane closures and traffic congestion, while high resistivity lessens the chance of corrosion. Latex and Supplemental Cementitious Materials (SCMs) such as silica fume, slag, and fly ash were added to improve workability and durability while reducing the overall porosity. The use of SCMs is a green technology because it uses waste material to reduce cement content, thus reducing the amount of energy needed in production. To determine the suitability of the mortar mixes, time of set, workability, resistivity, and compressive strength tests were conducted. From these tests and an economic analysis, the best design mixes were chosen and recommended. This is a two-year project and the second phase next year will scale up the recommended mortar mix to concrete.

MECHANICAL ENGINEERING

TITLE: Stowage Bin Counterbalance
NUMBER: ME 08.1
SPONSOR: The Boeing Company
SPONSOR LIAISON: Phillip Bobzien
FACULTY ADVISOR: Prof. Robert Cornwell
STUDENTS: Andrew Carson, Donnelle Nicaise, Ryan Ohashi

The Boeing Company has a number of interior designs on the 777 aircraft which use overhead pivoting bins to store carry-on luggage. To reduce the force a passenger needs to apply to close a loaded pivoting bin, The Boeing Company seeks to implement a counterbalance system. The design team created a contained counterbalance system that may be manually engaged when necessary. This device reduces the force needed to close a pivoting bin to less than 35 pounds, requires no electrical input, and quickly installs in the space beside the pivoting bin.

TITLE: Exhaust Gas Heat Recovery
NUMBER: ME 08.2
SPONSOR: Kenworth Truck Company
SPONSOR LIAISON: Jason Ritter
FACULTY ADVISOR: Prof. Christopher Stipe
STUDENTS: Matthew Dietzen, Chelsea Mortell, Richard Schultz, Patrick Stevenson

Kenworth is currently a leading manufacturer of fuel-efficient medium and heavy duty trucks. As part of their efforts to create more environmentally friendly vehicles, Kenworth is investigating ways to utilize wasted energy available in exhaust gases. To achieve this goal, they are developing a system that uses exhaust heat to boil a working fluid which in turn powers a steam turbine. The energy recovered by the turbine will augment the power of the truck engine, thus making it more efficient. Kenworth asked the design team to specify the working fluids and heat exchangers for the system. To accomplish this, the team designed a calculator which computes the necessary energy requirements for the working fluids. The calculator uses exhaust temperature, coolant temperature, and the properties of the working fluids to estimate the power available from the turbine. Using this data, the team specified a heat exchanger for use in the implementation of the system.

TITLE: Home Energy Kit
NUMBER: ME 08.3
SPONSOR: Puget Sound Energy
SPONSOR LIAISON: Todd Starnes
FACULTY ADVISOR: Prof. Mike Larson
STUDENTS: Wilson Kato, Eric Lim, Minh Vo

Puget Sound Energy (PSE) wants to help the consumer reduce energy consumption within the home in order to decrease general greenhouse gas emissions and lower overall energy costs. PSE asked the design team to create an energy monitoring kit that would allow residential customers to accurately track their energy usage. This kit will help consumers identify areas in the home where they consume significant amounts of energy. PSE anticipates that this information will motivate consumers to reduce energy usage. The team purchased several commercial devices that monitor the electricity used by household appliances. Focus group testing indicates that the kit should not be focused on energy efficiency, but rather the energy usage habits of the consumers. The final kit uses a combination of custom designed and commercially available devices.

MECHANICAL ENGINEERING

TITLE:	ASME Winrobo Competition
NUMBER:	ME 08.4
SPONSOR:	Seattle University
SPONSOR LIAISON:	Russ DeVlieg
FACULTY ADVISOR:	Prof. Frank J. Shih
STUDENTS:	Brendan Coburn, Will Gibbs, Travis Glover, Mike Linquist, Nick Lum

The American Society of Mechanical Engineers (ASME) sponsors an annual Student Design Competition with a unique problem each year. This year's project goal was to design and build a robot that could wash a double hung window. The competition rules severely limit size and weight (1 kg) and award bonus points for autonomy and the ability to move between the top and bottom window panes. Two separate designs were pursued by different members of the group. The "Dragon Fly" design utilizes two piston actuated suction cups coupled with a combination rack and pinion and lead screw drive. The robot integrates four motors and an autonomous controller circuit and is able to move between both panes, clean the entire window, and return to its initial position completing the competition. The "Dragon Fly" design competed in 2008 ASME District D (covering 7 western U.S. states, and 4 Canadian provinces and territories) and took first place. The team also hosted three exchange students from Kogakuin University who developed separate conceptual designs.

ELECTRICAL AND COMPUTER ENGINEERING

TITLE: Automated Waste Flap Door
NUMBER: ECE 08.1
SPONSOR: The Boeing Company
SPONSOR LIAISON: Kenneth G. Davis
FACULTY ADVISOR: Prof. Paul Neudorfer
STUDENTS: George Balagtas, John Halloran, Gregory Miller

The Boeing Company, one of the largest manufacturers of aircraft, is continually expanding its services to meet consumer needs. Thus, toward promoting a more hygienic passenger atmosphere, the company requested that the team design an actuator that automatically opens and closes a lavatory waste flap door upon attempts to deposit refuse. Furthermore, this device should activate without direct contact with the flap while complying with federal and company safety standards. The team developed its prototype with robust components including photoelectric sensors, a microcontroller, and a mechanical actuator. The design has been tested to achieve a reliability rating of 10-9 failures per flight hour. It also reflects a careful consideration of consumer psychology with respect to actuation timing and to component positioning.

TITLE: Starry Skies Ceiling Panels
NUMBER: ECE 08.2
SPONSOR: The Boeing Company
SPONSOR LIAISON: Frank Sexton
FACULTY ADVISOR: Prof. Agnieszka Miguel
STUDENTS: Jason Ashbach, Donjay Barit, James Howard, Darren Yu

One of the latest innovations in improving the experience of night flying is to provide the passengers with a view of a simulated starry night sky. The Boeing Company currently implements a starry night sky illumination effect on their aircraft ceiling panels with strategic location of LEDs on each panel. Boeing asked the design team to reduce the current cost of labor and the amount of power consumed by each panel. The team considered the manufacturing process of the ceiling panels and power consumption of the control circuitry. As a result, the control circuitry has been redesigned so that the wiring, weight, and power consumption on each panel are reduced. In addition, the control circuitry is flexible, as it can be reprogrammed and new functions can be added. The implemented system uses techniques of modulation, filtering, and a microprocessor controlled digital signal output.

TITLE: Energy Harvesting Device for Truck Exhaust
NUMBER: ECE 08.3
SPONSOR: Kenworth Truck Company
SPONSOR LIAISON: Stan DeLizo
FACULTY ADVISOR: Prof. Robert Heeren
STUDENTS: Vincent Chu, Tsz Chun Lo, Brent Rafalovich, Derek Roberts

Kenworth Truck Company, a division of PACCAR Inc., is one of the leading truck manufacturers that commercial and industrial businesses approach when procuring efficient customized diesel engine trucks. Kenworth seeks a solution to convert wasted heat from the hot exhaust system on the truck and directly convert it to usable electrical power. The additional power is used during breaks in remote areas to power small appliances and extend engine shut down periods without exceeding the depth of draw on the vehicles electrical storage system. The team designed a solution that utilizes a group of thermoelectric modules that can generate a significant amount of electrical current even with a small temperature gradient. Connecting several of these units together and running them through an analog regulator circuit generated enough power to exceed the project requirements (3.3-5V and 3A).

ELECTRICAL AND COMPUTER ENGINEERING

TITLE: Onboard Vehicle Data Adapter
NUMBER: ECE 08.4
SPONSOR: PACCAR
SPONSOR LIAISON: Mark Fredrickson
FACULTY ADVISOR: Prof. Alvin Moser
STUDENTS: Elliott Cahen, Gina Castro, Fabio Florez, Marine Pennaguer, Trent Styrcula

PACCAR Inc., a global technology leader in the design and manufacture of heavy duty trucks, requires real-time vehicle location and diagnostic information in order to provide quality customer support. To fulfill this requirement, PACCAR asked the design team to add more features to the existing Bluetooth Data Link Adapter built last year by SU design team ECE 07.5. Specifically, PACCAR wanted to include GPS, microSD, and a cellular data modem to the adapter to provide autonomous wireless access to the truck's data bus. To accomplish this task, the team redesigned the existing adapter to include a Telit module for cellular GSM and GPS functionality and added a microSD slot for on-board data storage. In order to support the additional modules, the Microchip processor was upgraded from an 8-bit to a 16-bit version. The new design now allows vehicle diagnostic information and GPS coordinates to be sent to PACCAR by using either the cellular network, or a Bluetooth connection to a local computer or Smartphone.

TITLE: RFID Technology Project for Ultrasound
NUMBER: ECE 08.5
SPONSOR: Philips Healthcare
SPONSOR LIAISON: Matthew Rieger
FACULTY ADVISOR: Prof. Robert Heeren
STUDENTS: Riley Higa, Andrew Kurniadi, Min Kyeong Lee, Mark John Merin, Robert Nguon

Philips Healthcare specializes in the design and manufacture of Diagnostic Ultrasound machines. Currently, diagnostic ultrasound examinations are typically held in clinics, not hospitals. Patient data is entered via a built in keyboard and is a time consuming and error prone process. With RFID technology, a quickly growing trend, Philips Medical Systems has asked the design team to implement an RFID solution for patient data entry on their ultrasound machines. The team researched and designed an RFID system consisting of a reader/writer and a patient data application complete with compression and encryption algorithms.

TITLE: Parental Controlled Game Auto-Shutoff
NUMBER: ECE 08.6
SPONSOR: R Plus Consulting
SPONSOR LIAISON: Blair Skidmore
FACULTY ADVISOR: Prof. Paul Neudorfer
STUDENTS: Cameron Imanpour, James Jenson, Bryce Perkins, Rafael Pinedo

R Plus Consulting is a strategic planning and services firm, specializing in custom built solutions to assist institutions of higher education to maximize their potential through the use of Recruitment Plus contact management software. R Plus Consulting asked the design team to seek a solution for over-usage of video game consoles for children ranging in ages from 7 -17 years. The solution is a designed console parental control type of device that a child should not be able to bypass when the parent does not want the child to play the game console. This device is mainly controlled by the tamper detection system, the microcomputer, and the software used by a microcontroller.

TITLE: SCADATOP Rewrite
NUMBER: CSSE 08.1
SPONSOR: Areva T&D
SPONSOR LIAISONS: Kevin Cheung, Robert St. Andre
FACULTY ADVISORS: Prof. Eric Larson
STUDENTS: Nick Arnold, Tim Carstens, Leeds Main, David Orbits

AREVA T&D Automation Systems unit provides fully integrated energy management networks monitoring software. AREVA's Redmond unit specializes in, among other things, the creation and maintenance of power grid topology monitoring and control technology. AREVA provides a robust power management system called e-terraplatform. The component of e-terraplatform that this project focused on is SCADATOP, which models vast power grid states. The team's project was the redesign of the SCADATOP application. The main goal was to create a scalable, efficient, and maintainable design using object-oriented principles to allow SCADATOP to extend beyond the e-terraplatform product line. To accomplish this task, the team had to do a code-level deconstruction of SCADATOP written in FORTRAN. Then, the team implemented the design with an object-oriented design in C++. This allows the e-terraplatform API's to be abstracted to accommodate AREVA's other product lines' API's. This also has the benefit of producing a more modern and maintainable product for Areva developers. As a result, the project decreased the degree of coupling SCADATOP had with e-terraplatform and allowing AREVA to penetrate new energy management markets.

TITLE: Online Procurement Tool
NUMBER: CSSE 08.2
SPONSOR: Nordstrom Inc.
SPONSOR LIAISON: Richard Nolle
FACULTY ADVISOR: Prof. Jeffrey Gilles
STUDENTS: Christopher Fingar, Moon Ok Kim, Marvin Larios Velasquez, Jaideep Nijjar, Christopher Williams

Nordstrom, Inc., one of the nation's leading fashion specialty retailers, had until recently been using a web-based application to handle their Request for Proposal (RFP) bid requirements. The system failed to perform up to Nordstrom expectations and was discontinued. Nordstrom is now performing the tasks manually. The objective of the project was to build a custom internal e-Sourcing tool using Visual Studio and integrated with Microsoft Office tools. The goal for the design team was to take an extensive existing set of requirements and UI designs and develop a usable end-to-end prototype.

TITLE: Project Management Database Conversion Tool
NUMBER: CSSE 08.3
SPONSOR: WaMu
SPONSOR LIAISONS: Bhanu Aluru, Tracy Zerbin
FACULTY ADVISOR: Prof. Yingwu Zhu
STUDENTS: Jonathan Drake, Garrett Sakimae, John Wilkinson

Washington Mutual (WaMu) maintains a massive amount of data concerning customer transactions. This data is used to understand their customers' wants, needs, and overall opinions. Strategically understanding all customers and their habits is very important to WaMu. All of this data can only be effective to them if they have a way of easily accessing and understanding it. WaMu asked the design team to create a tool that will provide their company with an easier way of accessing their data which will help them understand their customers better. This tool will accomplish this task by outputting a new star schema database which was dynamically created from their original database.

COMPUTER SCIENCE

TITLE: Automated Calibration Standards
NUMBER: CSSE 08.4
SPONSOR: Zetec
SPONSOR LIAISONS: Pauline Tarango, Teren Bryson, Bill Ziegenhagen
FACULTY ADVISOR: Prof. Annie Dai
STUDENTS: James Hoover, Stuart Schwartz, Chandra Setiawan, Grzegorz Szubzda

Zetec is the world-leader in providing nondestructive inspection solutions based on multi-method technologies. One service that is provided by Zetec is the production of calibration standards. Zetec requested that the design team create a web-based system calibration designing/ordering system that would replace their current, manual system. As a response, the team created a web-based system that allows a customer to design a calibration standard in an environment that automatically validates specifications against a set of rules. In addition to automated validation, the system provides a rendered image of the specified calibration standard upon completion. The new system will lower the time required, both on the part of Zetec and the customer, to produce a valid calibration standard.

MASTER OF SOFTWARE ENGINEERING

TITLE:	Virtual Flight Deck Simulator
NUMBER:	MSE 08.1
SPONSOR:	The Boeing Company
SPONSOR LIAISON:	Frederic Lambert, Bert Mount
FACULTY ADVISOR:	Prof. Jerry Williams
STUDENTS:	Cindy Balacy, Eugene Cherkassky, Alex Donaldson, Anton Polinger

The Boeing Company is one of the largest manufacturers of commercial airplanes and also provides simulation training on their products. The simulation labs support a variety of software systems and design toolsets for producing flight visualization products. The Virtual Flight Deck (VFD) provides a visual view of a cockpit's panel layout and design. The VFD gives the user a view of how the controls are laid out, and is also able to use the controls on the cockpit and run actions on the simulation. This system is developed using the NetBeans IDE and Java programming language. Each panel is made up of multiple objects called Widgets. The Widget library is made up of knobs, switches, buttons, labels, and text boxes. The design team's goal is to improve the customization of new and existing panels and Widgets and provide a solution for ongoing maintenance.

TITLE:	Unity Product Enhancements
NUMBER:	MSE 08.2
SPONSOR:	Cisco Systems
SPONSOR LIAISONS:	Harvinder Chowdhary, Glen Frison, Darren Massey, Jason Swager
FACULTY ADVISOR:	Prof. William Poole
STUDENTS:	Lita Chakma, Kavyashree Keelara, Sanjay Lakkad, Trupti Mande

Cisco Unity is a powerful Unified Communications solution that provides advanced, convergence-based communication services such as voice and unified messaging on a platform that offers the utmost in reliability, scalability, and performance. CISCO constantly releases updates to Unity which are called Engineering Specials (ES's). In between version Updates, CISCO releases hundreds of ES's for a unity version. The rolling up of ES's is currently done using a home grown/custom installer. This installer uses the mechanism of checking CRC's to install files. This introduces issues with installing new files and also introduces other issues which developers need to overcome while creating ES's. Working through all these issues makes creating and editing ES's a cumbersome task for the users. Also maintaining this custom Installer and making upgrades to it to keep up with changing technologies is an expensive task. The objective of this project is to convert the current custom installer to use the Windows Installer underneath and move away from the CRC checking mechanism, thus making the ES installer easy to use and maintainable.

MASTER OF SOFTWARE ENGINEERING

TITLE:	Time Tracking and Reporting System
NUMBER:	MSE 08.3
SPONSOR:	ElderHealth
SPONSOR LIAISON:	Sean Walsh
FACULTY ADVISOR:	Prof. Robert Musson
STUDENTS:	Dimpy Gill, Keith Schifferli, Vijay Singari

ElderHealth is a company that provides in-home health care to both public and private clients. ElderHealth conducts their clients' and employees' time tracking on paper, entering the data into spreadsheets and forwarding those spreadsheets to various departments (payroll, accounting, etc). As ElderHealth grows, the need to maintain electronic records becomes important to maintain audit compliance. Also, through automation the company hopes to streamline and improve their processes. The design team developed the ElderHealth Time Tracking and Reporting System, with the primary goal for the system to maintain clients' and employees' data and time and to generate reports needed by various internal departments and the state government. A secondary goal of the project was to enable a platform that could be leveraged by other similar companies in the field. The team approached this project using TSP (Team Software Process) and PSP (Personal Software Process) as prescribed by the SEI (Software Engineering Institute). This release (Version-1) is designed to be scalable and flexible enough that other companies in this industry can leverage the product as well. The software was also designed to be easily extendable beyond version 1.

TITLE:	Business Analysis and Prediction System
NUMBER:	MSE 08.4
SPONSOR:	InSpa Corporation
SPONSOR LIAISON:	Prof. David Joslin
FACULTY ADVISOR:	Prof. Jeffrey Gilles
STUDENTS:	Mehdi Slaoui Andaloussi, Isaiah Paradise, Jeffrey Toce

InSpa, a local spa company, provides affordable, high-quality spa products and services. InSpa's business model pays their employees active and inactive pay rates depending on if they are servicing a client or not. Part of the challenge is efficiently designing the employee schedules to meet projected customer demand, and reduce wasted idle time. InSpa desires an application which will use sales history and projected demand to generate efficient schedules in terms of profit while minimizing turnover caused by encroaching on non-ideal schedules for the employees. The project team is tasked with designing a scalable and open architecture for plugging in various scheduling algorithms. Testing and measuring these scheduling algorithms on their ability to generate efficient schedules for the company and the employees is the basis of this research project. This research highlights the different properties of designing an efficient scheduling algorithm which is configurable and flexible to achieve the desired result of maximizing profit while reducing the negative impact on their employees.

MASTER OF SOFTWARE ENGINEERING

TITLE:	Using Probabilistic Models on Prototypes to Measure Reliability
NUMBER:	MSE 08.5
SPONSOR:	Seattle University
SPONSOR LIAISON:	Prof. Roshanak Roshandel
FACULTY ADVISOR:	Prof. Roshanak Roshandel
STUDENTS:	Abhijit Chaporkar, Jerel Frauenheim

Software Engineering best practices have demonstrated that it is less costly to fix software defects that are found early in the software development process. Software Architecture plays a focal role in development of quality software systems. Over the past few years several architecture-level reliability modeling approaches have been proposed. This research project aims at expanding the young field of predicting and analyzing architecture-level reliability by improving the practicality of existing approaches to make them easier to apply. Using standard probabilistic techniques common in speech recognition, digital signal processing and web search, the team is examining software architecture and prototypes, both measuring the reliability of the prototype, and potential reliability of new use cases or new deployment scenarios. The team is demonstrating strategic instrumentation of code through decompiling and recompiling the code, collecting information during the prototype's runs, and applying analyzing the reliability value using different Hidden Markov Model chains.

SPONSORING ORGANIZATIONS, MANAGERS, AND LIAISONS

We want to acknowledge with special thanks the organizations that sponsored projects in 2007-2008, and especially the managers and 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.

AREVA T&D	Kevin Cheung, Robert St. Andre
The Boeing Company	Phillip Bobzien, Mark Cloud, Ken Davis, Bill Jones, Frederic Lambert, Bert Mount, Frank Sexton
Cisco Systems Inc.	Harvinder Chowdhary, Glen Frison, Darren Massey, Ed Masters, Jason Swager
ElderHealth	Sean Walsh
Electroimpact	Russ Devlieg
Group Four Inc.	Jeffrey Dye, Brian Caferro
InSpa Corporation	Lance Corbin, R. Michael Ostrem
Kenworth Truck Company	Stan DeLizo, John Duffy, Jason Ritter, Alec Wong
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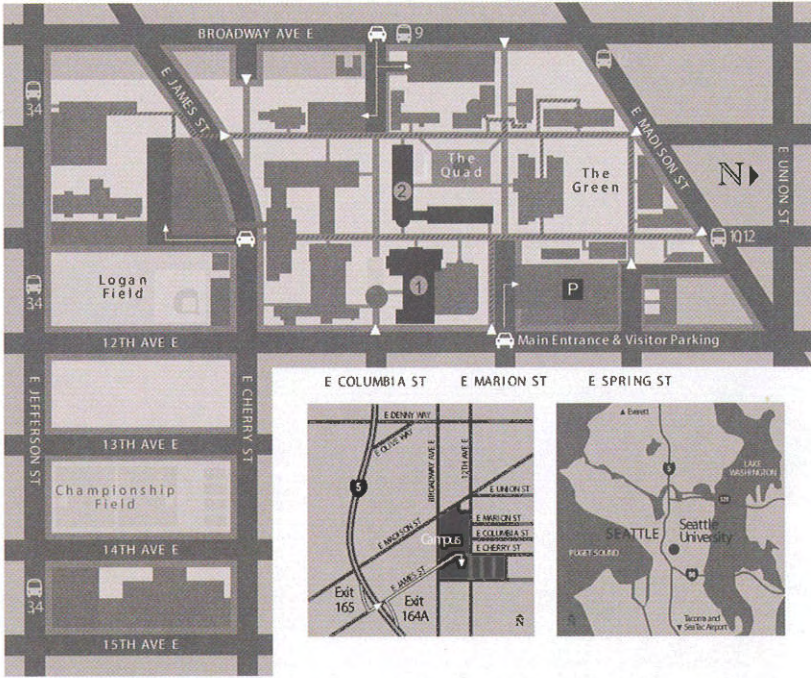
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- ▲ Campus Entry Point ♿ Accessible Route 🚌 King County Metro 🚗 Parking Entrance P Parking
- ① Sullivan Hall (School of Law) ② Bannan Center For Science & Engineering

DIRECTIONS FOR PROJECTS DAY

FROM THE NORTH:

- Head south on I-5
- Take exit 165A to James Street
- Left onto James Street
- Left onto 12th Avenue
- Left onto East Marion Street

FROM THE SOUTH:

- Head north on I-5
- Take exit 164A to James Street
- Right onto James Street
- Left onto 12th Avenue
- Left onto East Marion Street



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