



DECEMBER 10, 2011 SATURDAY

WRRF December Workshops @ Santa Clara University

Bannon Hall (Engineering), Building 404

REGISTRATION

Register online via

[http://www.surveymonkey.com/s/WRRF Dec 2011 Workshops](http://www.surveymonkey.com/s/WRRF_Dec_2011_Workshops)

*****Remember to complete TWO Pages on the registration or you will NOT be registered.**

OR come the day of the workshop to register...

AGENDA

8:30 a.m.	–	9:00 a.m.	Check-in & Pay from Pre-Registration List; Register for any OPEN slots (Bldg 404: Rm 107 & 108)
9:00 a.m.	–	9:30 a.m.	Introductions & Kickoff (Bldg 404: Rm 326)
9:30 a.m.	–	12:15 p.m.	Extended AM Workshop
12:15 p.m.	–	1:00 p.m.	Lunch (Bldg 404: Rm 326)
1:00 p.m.	–	2:30 p.m.	WORKSHOP SLOT A
2:30 p.m.	–	4:00 p.m.	WORKSHOP SLOT B
4:00 p.m.	-	4:15 p.m.	WRAP-UP Bldg. 404: Rm 326)

COST: \$7 covers **WHOLE DAY & Lunch (Pizza)**

THANK YOU TO OUR SPONSOR!

Santa Clara University, College of Engineering

Workshop Threads

TECHNICAL STUFF: <i>THE BASICS & BEYOND!</i>		
<ul style="list-style-type: none"> - Intro to Robot Sub-Systems - Electronics (Basic & Intermediate) - Fundamentals of Machine Vision - Pressure can be good for robots! 	<ul style="list-style-type: none"> - Intro to PID Control - Safety for FRC robot - DC Motors on FRC Robot 	<ul style="list-style-type: none"> - Intro to FRC Robotics - Electronics (BASIC)
SOFTWARE FOR FRC		
<ul style="list-style-type: none"> - LabVIEW and cRIO-based FRC control system - Whirlwind Tour of Java for FRC Controller 	<ul style="list-style-type: none"> - C++ Beta Test Experience 	<ul style="list-style-type: none"> - What software is best for FRC Robots & your team?
DESIGN TOOLS: CAPTURING THOSE IDEAS!		
<ul style="list-style-type: none"> - Designing with Solidworks 	<ul style="list-style-type: none"> - CAD Designs: FRC teams (Solidworks & Inventor) 	
OUTREACH & ENTREPRENEURSHIP		
	<ul style="list-style-type: none"> - Entrepreneurship: FRC Teams 	<ul style="list-style-type: none"> - Hands-on FUN: Outreach Activities for 5th to 8th graders

See details for each course on next pages

Extended AM Workshops (9:30 a.m. - 12:15 p.m.)

TECHNICAL STUFF: THE BASICS & BEYOND!

- **Introduction to Robot Sub-Systems**— Learn about four key systems on a FIRST robot: pneumatics, electrical power distribution, electronic sensors & speed controllers, and a discussion of common wheel & motor layouts
Instructor: Lynbrook HS, FIRST #846: B.Axelrod, E.Yeh, M.Lin, A.Agrawal, A.Makineni, J.Zhang, M.Chan
Intended Audience: Beginning students & adults
- **Electronics: BASIC & INTERMEDIATE**—this workshop covers everything from the ground up. Introduction to the terminology of volts and amps, wire gauges, etc. Beginning theories of electricity, such as Ohm's Law shared. Learn about all the power distribution and electronic components in the FIRST kit of parts as well as common mistakes and pitfalls for new teams and new students.
Instructor: Mike Schmit, Team 1351 FRC Mentor & WRRF BOD VP, AMD Program Manager
Intended Audience: beginners
- **Fundamentals of Machine Vision**— A relatively non-mathematical introduction to computer vision principles and algorithms with some examples from FIRST competitions. This is NOT an introduction to the NI Vision Software.
Presenter: Tim Craig, Software Engineer
Intended Audience: Beginners in machine vision, **intermediate to advanced** in FRC robotics
- **Pressure Can Be Good For Your Robot** — Pneumatic actuators differ from DC motors in some key aspects, including peak & sustained power, motion direction, & tolerance for stalling. Get an introduction (or refresher) on why you should consider pneumatic power, what works best, and how to design & specify it. Gain practical tips with hands-on assembling & debugging, including how to wrap pipe tape and why Windex® is your friend.
Instructor: Eric Sklar, FRC inspector and ref, FLL and FTC ref, safety engineer
Intended Audience: Anyone not using pneumatic power or having “challenges” with it

SOFTWARE FOR FRC

- **LabVIEW and cRIO-based FRC control system**— Overview of the FRC Control System hardware. Tips on using LabVIEW to develop robot software. Configuring the various control system components. Creating an FRC cRIO Robot Project in LabVIEW. Using the WPI Robotics Library Vis. Deploying and debugging code on the cRIO. If possible, attendees should bring a laptop with the 2011 FIRST Competition Software installed to work through examples along with the instructor.
Instructor: Laura Rhodes, Software Engineer, Pyxis Engineering Corp. Mentor, FRC Team 100, The Wildhats, Woodside/Carlmont/Sequoia Robotics
Intended Audience: students, mentors, parents, with some programming experience
- **Whirlwind Tour of Java for FRC Controller**—Grounds-up review of using Java, the syntax and process from the perspective of the FRC Controller. Bring a laptop for optimum participation.
Instructor: Randy Picolet, *Software Engineer*, Mentor, FRC Team 2159, The RoboPirates.
Intended Audience: students, mentors, parents, with some programming experience

DESIGN TOOLS: CAPTURING THOSE IDEAS!

- **Designing with Solidworks:** Instructors will deliver a short Solidworks demonstration and then time will be spent doing a hands-on project.
Instructor: Rick Damiani & John Korzick, Patton Group
Intended Audience: beginners

AFTERNOON WORKSHOPS (SLOT A—1:00 – 2:30 p.m., SLOT B— 2:30 – 4 p.m.)

OUTREACH & ENTREPRENEURSHIP

- **Entrepreneurship Presentations from FRC Teams (SLOT A)** —Learn what other teams have been doing to operate like a business, raise money, and be successful at entrepreneurship!

Instructor: Team 649, 254, and others

Intended Audience: students, mentors, parents

- **Hands-on FUN: Outreach Activities for 5th to 8th graders (SLOT B)** —Wind up your workshop day with a hands-on fun project. Outreach programs help a team grow its future base and look good on award applications! Plus it's fun. ☺

Instructor: Ceal Craig: Researcher, educator & engineer

Intended Audience: students, mentors, parents

TECHNICAL STUFF: THE BASICS & BEYOND!

- **Introduction to FRC Robotics (SLOTS B):** Overview of the FIRST build season and competition, specifically tailored to rookie teams going into their first build season

Instructor: Cara Lai, Team 1868, Student

Intended Audience: beginners

- **Intro to PID Control (SLOT A):** Covers the theory and practical uses of PID. Examples will be in LabVIEW but the concepts apply to any programming language. Bring your own code for dialogue and sharing..

Instructor: Nathan Dushman, Software Engineer, Kateeva

Intended Audience: anyone interested in process control (I don't want this to sound restricted to beginners)

- **Safety for a FRC robot & More (SLOT A):** Learn about good safety practices from a safety engineer!

Instructor: Eric Sklar, FRC inspector and ref, FLL and FTC ref, safety engineer

Intended Audience: Beginners

- **Electronics: BASIC (SLOT B)** — this workshop covers everything from the ground up. Very basic introduction to the terminology of volts and amps, wire gauges, etc. Beginning theories of electricity, such as Ohm's Law shared.

Instructor: Mike Schmit, Team 1351 FRC Mentor & WRRF BOD VP, AMD Program Manager

Intended Audience: beginners

- **DC Motors on your FIRST Robot (SLOT A)**— A tutorial on how DC Permanent Magnet Motors work and how to use them. Topics: torque & force; motor torque vs speed; how to choose the right motor and gear ratios.

Presenter: David Giandomenico, Team Coach for Lynbrook Robotics FIRST #846

Intended Audience: Students with strong math or physics skills, adults. Not recommended for rookies.

SOFTWARE FOR FRC ROBOTS

- **C++ Beta Test Experience (SLOT A):** Team 604 will describe their experience, what they found, and prepare other teams for the new software application on FRC.

Presenter: John Best & Members of Team 604, Leland Robotics

Intended Audience: Students & Adults working on software for FRC Robots.

- **PANEL: What software is best for FRC Robots & your team?? (SLOT B)** C++? LabVIEW, Java? Hear this distinguished panel's thoughts and ask questions of them all.

Presenter: FRC Mentors & Engineers: John Best (#604); Laura Rhodes (#100); Randy Picolet (#2159)

Intended Audience: Students & Adults working on software for FRC Robots.

DESIGN TOOLS: CAPTURING THOSE IDEAS!

- **CAD Design Award Presentations from CalGames (SLOT A):** Teams that competed in CalGames CAD design award will present their CAD efforts on various platforms: Solidworks & Inventor

Instructor: Teams 254, 649, 751, 3256

Intended Audience: Anyone interested in learning more about CAD on FRC



Directions

Santa Clara University is located near State Highway 101, County 87 (Guadalupe Parkway), and Interstate 880. You can locate directions and more detailed street information at <http://www.scu.edu/map/>

After turning west off of El Camino Real through the entrance onto Palm Drive, (past stadium on the left/south) take the second LEFT opportunity and drive into the Parking structure (first left opportunity is into a parking lot for the stadium); parking is FREE on Saturday. The Engineering building is directly west of this structure, Building 404 on the map.

See Google Custom Map

<http://maps.google.com/maps/ms?ie=UTF8&hl=en&msa=0&ll=37.350613,-121.937535&spn=0.004463,0.004227&t=h&z=18&msid=104270999160529009421.00049155be850d93027d3>

WRRF ORGANIZATION & BOARD OF DIRECTORS

Dr. Eugene Brooks, *President* Mike Schmit *Vice-President* Ceal Craig, *Treasurer* Alvin Cheng, *Secretary*
BOD Members: Deborah Epperson, Mark Epperson, Dr. Chris Kitts

About WRRF: The Western Region Robotics Forum (WRRF) is a non-profit organization dedicated to promoting the educational use of robotics and providing support for the Bay Area FIRST robotics teams. WRRF offers a series of pre-season workshops for FIRST teams covering a wide range of subjects, including team management, electronics, computer animation, drive train design, and software development. WRRF organizes a Northern California Robotics off-season competition (“CalGames”). For more information, contact Ceal Craig, Ceal@WRRF.org or WRRF.Info@WRRF.org