CalPlug Demo and Education

Melissa Valdez
Research Assistant

www.calplug.org

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1KWH CHALLENGE

- **Why**
  - Accessible to the community
- **Design process**
  - Room size: 28'x30'
  - Teams: 6 months to create the first version of the 1kwh challenge
  - Audience: UCI graduates and Undergraduates
  - Outreach: media, school fairs and emails

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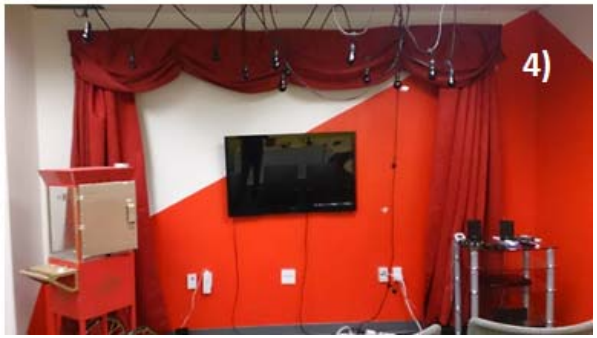
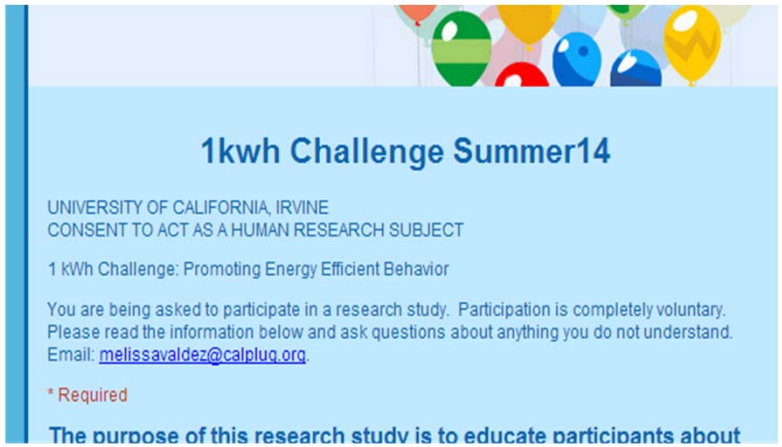
1KWH CHALLENGE





1kwh Challenge Summer14

UNIVERSITY OF CALIFORNIA, IRVINE
CONSENT TO ACT AS A HUMAN RESEARCH SUBJECT

1 kWh Challenge: Promoting Energy Efficient Behavior

You are being asked to participate in a research study. Participation is completely voluntary. Please read the information below and ask questions about anything you do not understand.
Email: melissavaldez@calplug.org.

* Required

The purpose of this research study is to educate participants about

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Numbers

PARTICIPANTS FROM 12 DIFFERENT COUNTRIES

11 DEVICES, 1 HOUR, 4 PARTICIPANTS. 1 CHALLENGE

684 Successful Ping-Pong Shots

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1KWH CHALLENGE 2.0

- The challenge will be open to all 30,000 UC Irvine graduate and undergraduate students on campus and off.
- 600 registered campus organizations at our disposal.
- The challenge is designed to be promoted by social media with over 100 group pages affiliated to UCI on Facebook.

YouTube

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Questions and Comments?

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The Wall of Power

Sergio Gago, Ph.D.
Lead Interface Engineer

November, 2014

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The Wall of Power at CalPlug (WoP)

What is Wall of Power?

- Interface to help users to improve **Energy Efficient** at home.

Main goals

- Maximize energy consumption awareness.
- Advise on the purchase and search for more efficient technologies.

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The Wall of Power at CalPlug (WoP)

Main Interface Features

- Monitor plug loads and their energy consumption on the wall or mobile device.
- Check the total accumulated consumption.
- Check the current energy price being used based on user's location and time.
- Remote interface to display and control plug load devices.
- Provide a new database to find top energy efficient products.

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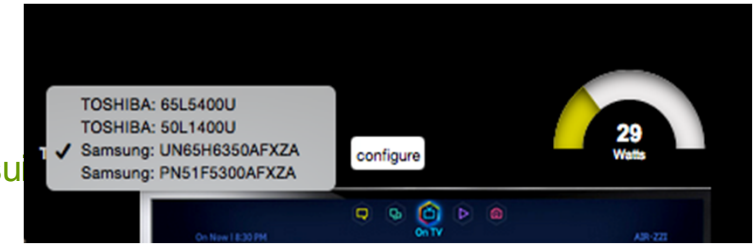
The Wall of Power at CalPlug (WoP)

Main features to provide personal advice *(under development)*

- based on current setup features
  - Compare features to suggest better operation or more efficient products

- based on user's preference to purchase new products
  - List top products according user's preferences based on price, performance and energy efficiency.

- based on user's behavior
  - Provide tips to avoid wasting habits or to acquire more su



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The Energy Channel

Zhentao Sun, MSEE
Project Manager

November, 2014

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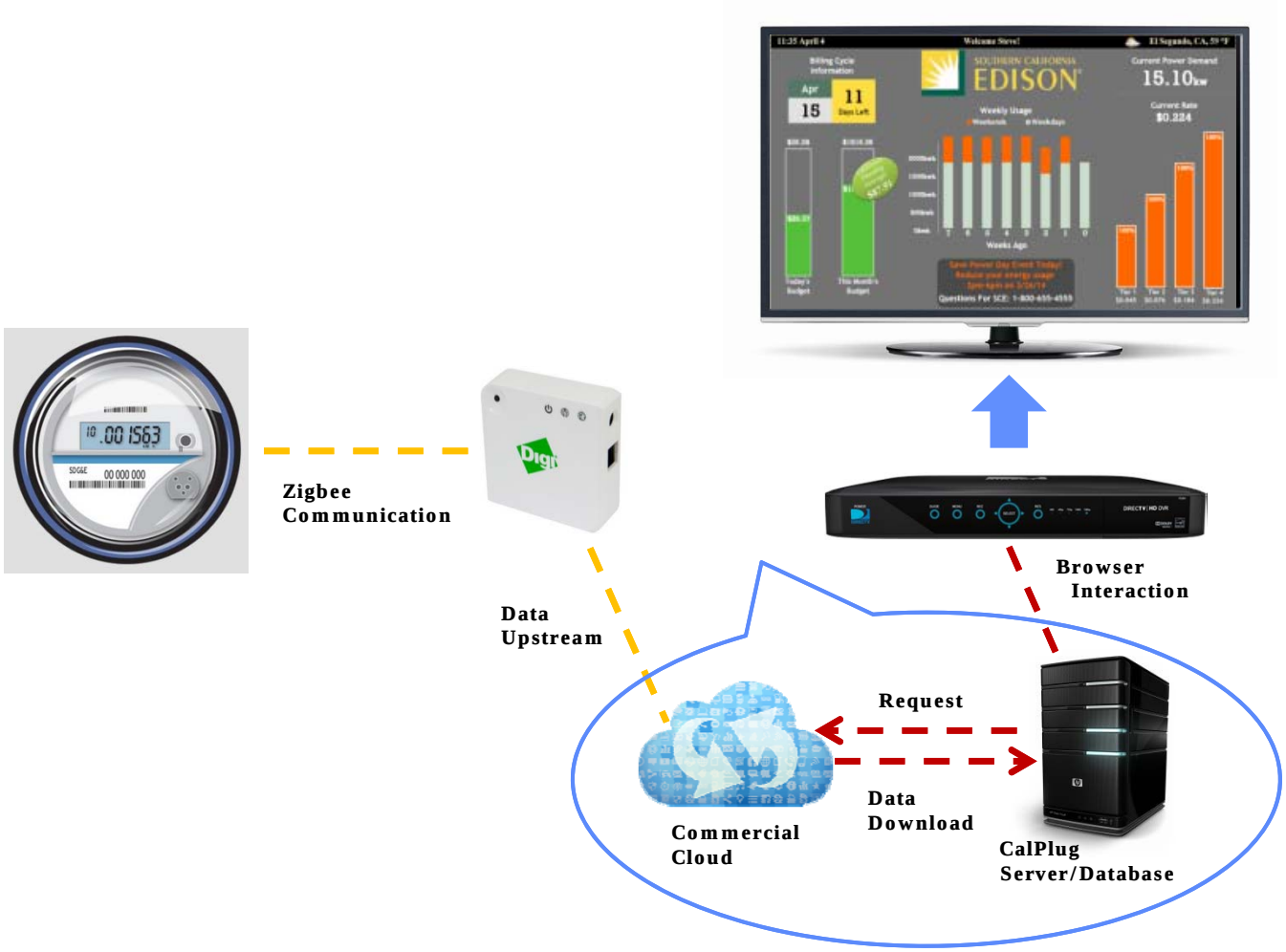
Seamless Integration with Home Entertainment

Smart Meter Data on TV



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Getting the Message Across

- To build a channel that connects Smart Meter Energy Info with utility customers
- Fast and convenient delivery of demand response info (incentive programs) and tips/alerts
- Multiple interfaces (mobile, tablet, web)

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California Institute for Telecommunications and Information Technology

November 06, 2014

Linyi Xia

www.calplug.org

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Overview

- **Bio:**
  - **Linyi Xia, UCI BSEE 2014, Jr. Research Specialist**
  - **Emphasis on Embedded systems design, 3rd year in the field.**
- **Roles and Projects:**
  - **Rapid prototyping, and product developments for various project focusing on energy efficiency.**
  - **Recognizing and introducing emerging technologies to take the research to the next level.**

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Solar Decathlon

- 17 teams of world wide universities.
- Design, build and operate solar-powered houses that are cost-effective, energy-efficient, and attractive.
- Serves and advise students on electrical system design.

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SIM Home

- Demonstrate the newest technology in house
  - GaN technology infused inverter design.
  - Energy Smart
  - Energy Measuring/Monitoring (Mingfeng)
  - Many more
- Showcase:
  - Manufactures' newest and greatest products and technologies.
  - Trending in home plug load appliances
- Future Goals:
  - Expand beyond just the home seting
  - Evolve with the market and potential opportunities.

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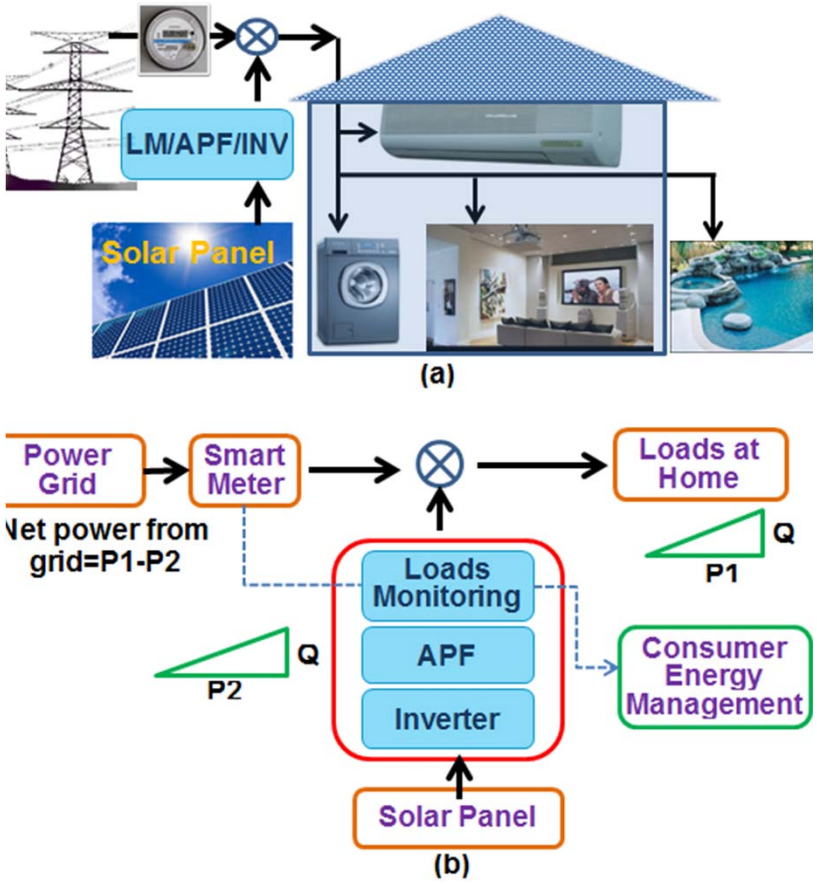
Smart Power for the Smart Home: Inverter Controls, Power Factor corrections, and Peak Demand Reductions



- Inverter-integrated active power factor correction
- Load signature analysis for wireless load monitoring and control
- Integrated design and control of HVAC and storage for shifting peak demand (UCD)

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CalPlug Engineering Lab

Minfeng Wang, Engineering Lab Manager

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CalPlug SIM Labs

SIM Office

SIM Living Room

Bench-top Test

Field Trial

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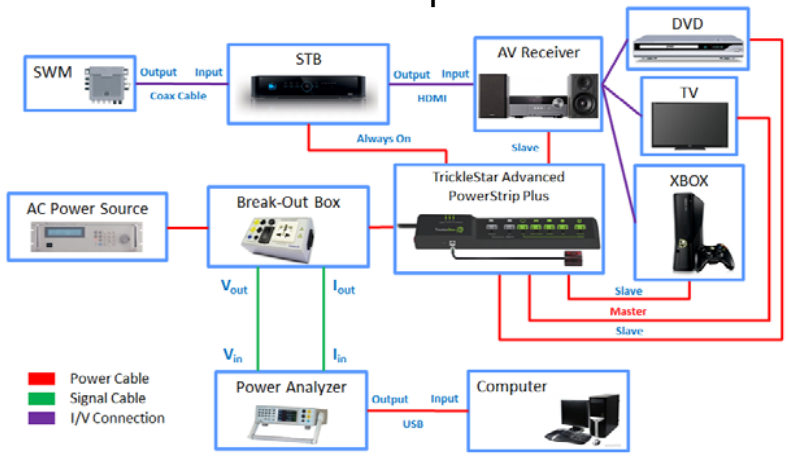
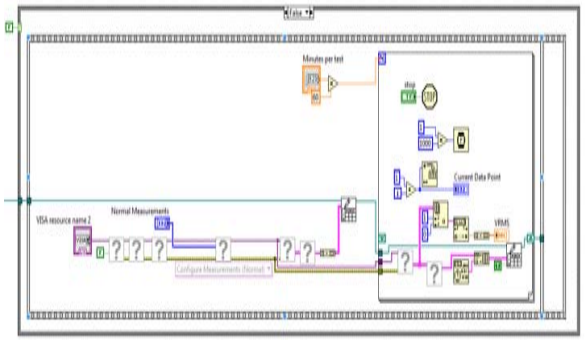
SIM Lab Test

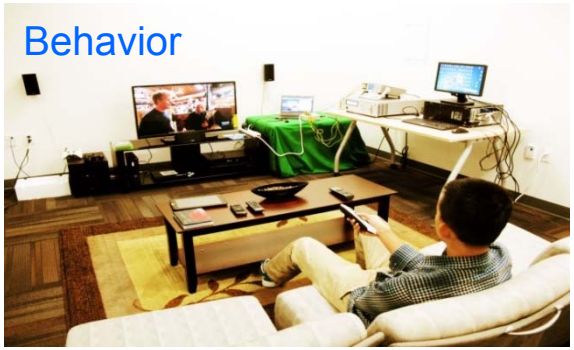
Test Setup



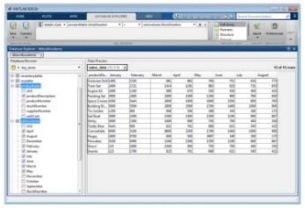
Data Acquisition

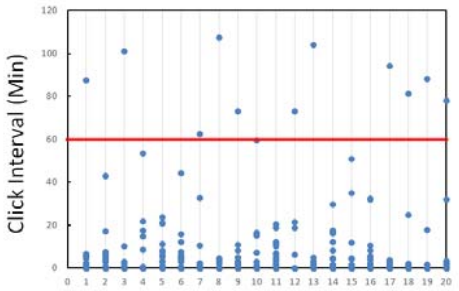


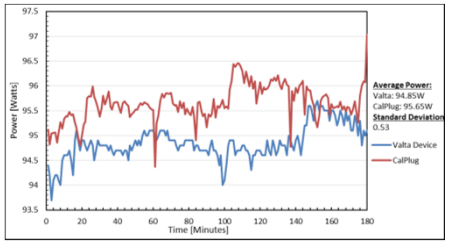
Behavior



Data Monitoring and Storage







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Collaborators

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