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<http://www.engr.uvic.ca/~seng321/>
<https://courses1.csc.uvic.ca/courses/201/spring/seng321>

Announcements

- New class room as of Wed
 - MAC 288 (original one)
- Midterm rescheduled due to lab clash
 - Fri, Feb 26 in class **confirmed !!**
- Assignments/Deliverables
 - S0, C0, S1, C1 specs posted
 - Group website spec posted
- Projects
 - Original RFP posted again

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Projects

- Car Wash - [REQ](#)
- GPS Enabled Text-Adventure RPG - [REQ](#)
- Meals for the Moment - [REQ](#)
- Shower Management System - [REQ](#)
- Course Schedule Creator - [REQ](#)
- Good Morning: Wake up smarter - [REQ](#)
- SERVEitude! - [REQ](#)
- Location & Time Based Restaurant Specials - [REQ](#)
- EventCity-The best Queueing System - [REQ](#)
- Lumin - [REQ](#)
- ELW Locker Reservation System - [REQ](#)
- Ability Hire - [REQ](#)
- Opportunity App - [REQ](#)
- Smart Beverage Dispensing System - [REQ](#)
- Mobile Lighting Control System - [REQ](#)

Last updated Jan 19, 2016

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Harshit Jain

ELW B215

LEGEND
 X → Y X is the supplier for Y
 X → Y X is the client of Y

Priya Angara

ELW B220

LEGEND
 X → Y X is the supplier for Y
 X → Y X is the client of Y

Project Deadlines and Marks

Students must participate in all project presentations in class & labs
 No show results in a 25% reduction in the mark for that presentation

1.	Call for Project Proposals		6 Jan (Class)
2.	Request for Proposal (RFP)		8 Jan
3.	Project selection		12 Jan (Lab)
4.	Team selection		14 Jan (Lab)
5.	Related work (S0)	5%	22 Jan (Lab)
6.	Project website up and running	5%	26 Jan (Lab)
7.	RFP2 Informal Requirements Specification (C0)	5%	29 Jan (Lab)
8.	Formal Requirements Spec (S1)	10%	16 Feb (Lab)
9.	Customer Feedback on S1 (C1)	5%	18 Feb (Lab)
10.	Detailed Requirements Spec (S2a)	10%	1 Mar (Lab)
11.	Prototype demo (S2b)	5%	3 Mar (Lab)
12.	Customer Feedback on S2a-b (C2)	5%	8 Mar (Lab)
13.	Final Requirements Spec (S3a)	15%	15 Mar (Lab)
14.	User Manual (S3b)	10%	22 Mar (Lab)
15.	Customer Feedback on S3a-b (C3)	5%	24 Mar (Lab)
16.	Demo Final Project (S4)	10%	29,31 Mar (Lab)
17.	Customer Feedback on S4 (C4)	5%	29,31 Mar (Lab)
18.	Instructor and TA Evaluations (S5)	5%	1 Apr


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Situational Awareness (SA)

- SA is the perception of environmental and personal context with respect to time and space
- Comprehension of its meaning and its projection into the future
- Critical to decision-making in complex, dynamic situations

- Applications
 - Mars Curiosity
 - Aviation—UAV, drones
 - Military command and control
 - Emergency services



- Applications
 - Driving a car
 - Crossing a street
 - Playing soccer
 - Playing basketball
 - Shopping

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SELF-ADAPTIVE SYSTEMS (SAS)

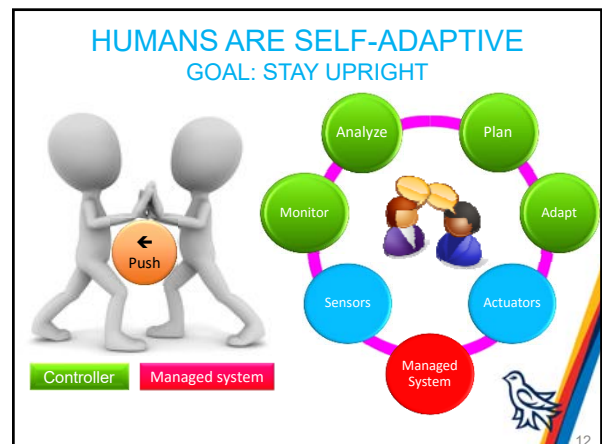
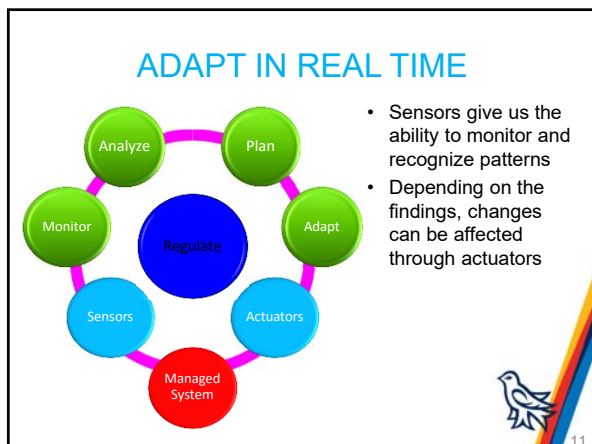
- A SAS can alter its behaviour at runtime (on the fly) in response to its perception of
 - its environment
 - its own state
 by adapting itself
- SAS abilities
 - Assess its own behaviour
 - Observe its context or environment
 - Adapt without shut down



iRobot's new drone is a rock-steady flyer

Müller and Villegas: Runtime evolution of highly dynamic software, in Evolving Software Systems, Mens, et al. Springer, pp. 229-264 (2014)

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EXERCISE

Identify and discuss the actions performed by **sensors, monitor, analyzer, planner, adapter** and **actuators**

Controller Managed system

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GOAL: ACHIEVE EQUILIBRIUM

- **Sensors**
 - Touch points
 - Force sensors
 - Direction sensors
 - Eyes/pupils
 - Breathing
- **Monitor**
 - Number of touch points
 - Measure force
 - Measure force direction
 - Taking a deep breath
 - Pupils enlarge
- **Analyzer**
 - Push or pull pattern
 - Gentle or strong pattern
- **Planner**
 - Push → push back with same force
 - Pull → pull back with same force
 - Gentle or strong pattern
- **Adapter & Actuators**
 - Fire muscles to push or pull lightly or strongly

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SITUATION AWARENESS (SA)

- Perception of the environment within a volume of space and time
- Comprehension of their meaning
- Projection into the future

—Endsley 1999

Bombardier Challenger 300

Survival

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SITUATION AWARENESS (SA)

- Perception of the environment within a volume of space and time
 - **Sense the local environment**
 - > Surrounded by plant
- Comprehension of their meaning
 - **Analytics**
 - > Surrounded by edible plant
 - > Surrounded by meat-eating plant
- Projection into the future
 - **Planning, adapting**
 - > Eat edible plant
 - > Be eaten by meat-eating plant

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SA APPLICATIONS

Applications

- Mars Curiosity
- Aviation—UAV, drones
- Command and control
- Emergency services

Applications

- Driving a car
- Crossing a street
- Playing soccer
- Playing basketball
- Shopping


James Rodriguez
World Cup 2014
Top Goal Award

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CONTEXT AWARENESS

Lockheed Martin Advanced Technologies Lab
www.atl.external.lmco.com


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We are in the Age of Context

CONTEXT

"Context is the new battleground between Android, iOS, Windows as well as Apple, Google, IBM, Microsoft, Samsung."




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PILLARS OF CONTEXT

- The Internet of Things
 - Sensors for location, light, motion, temperature
 - Record, transmit findings to control instruments
- Semantic web, big data, analytics
 - Clouds store massive data on everything
 - Everything accessible on the web
- Digital mapping
 - Every square inch of the world is mapped
- Really smart mobile devices
 - Every person has one
 - Highly customized smart applications
- Mature social media
 - Highly personalized virtual networks
- Wearable computers
 - Microsoft HoloLens, Apple watch, Google driverless car

Scoble, Israel:
The Age of Context: How It Will Change Your Life & Work, 2013.



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NATE SILVER




- American statistician and writer who analyzes baseball and elections
- In 2008 correctly predicted the winner of US presidential election in 49 out of 50 states and all 35 US Senate races
- 2009 *Time Magazine* World's 100 Most Influential People
- In 2012 correctly predicted the winner of all 50 states and 31 out of 35 US Senate races by analyzing social media ← context



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India



MINDBOGGLING SITUATION AWARENESS

Japan



HUMANS ARE AMAZINGLY ADAPTIVE



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STREAM OF CONTEXT





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STREAM OF CONTEXT




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CAPTURE THE STREAM OF CONTEXT



Microsoft HoloLens

Google

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INSTRUMENT PEOPLE



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KILLER APPLICATION





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EXERCISE

- Who wants to be a volunteer for conducting experiments with this killer application?
- You will get to use some cool devices such as HoloLens!



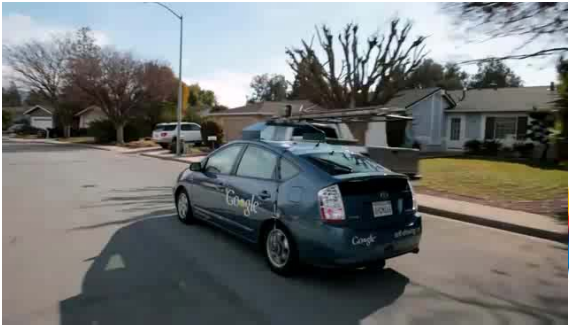
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Who thinks this experiment is possible right now?

GOOGLE DRIVERLESS CAR — 2:07 MINS

LICENSED IN CALIFORNIA, NEVADA AND FLORIDA



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