Wednesday Meeting Updates
Sept 28th 2016

UBC Chem-E-Car | Engineering Design Team
The University of British Columbia, Vancouver

WWW.UBCCHEMECAR.COM

ADMIN UPDATES - 1

- **Generate 2016** conference, registration closing soon!
  Anyone else interested? Talk to Abhi, Said or Victor

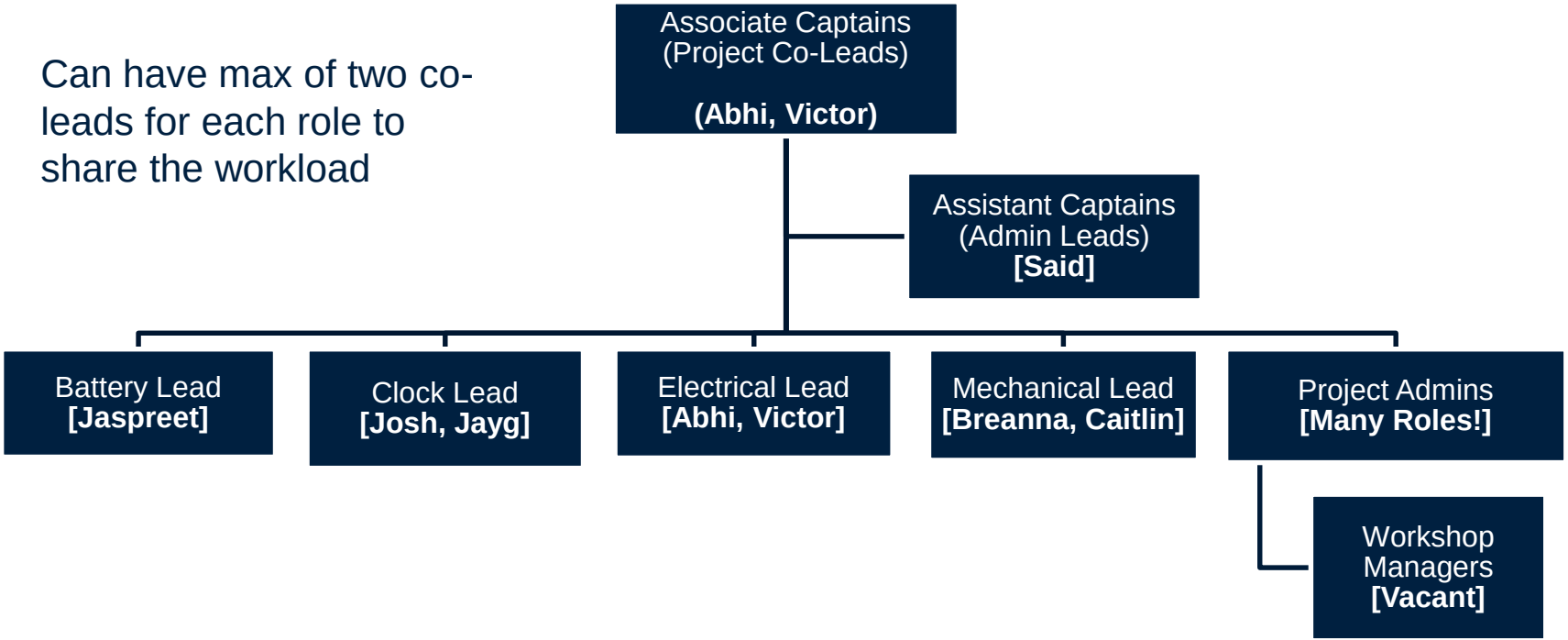
- **Why join?**
  Free conference tix worth $100+
  Fancy food at the Hyatt downtown
  Potential $500 prize for the winner
  Presentation experience
  Networking with co-op employers (huge advantage over your peers if you're in second year)

ADMIN UPDATES - 2

- Sign up for the mailing list www.ubcchemecar.com/joinus.html
- Join the FB group, search for **‘2016-2017 UBC Chem-E-Car’**
- Join your sub-team’s group chats

JUNIOR CAR ORGIZATION CHART - UPDATE

Can have max of two co-leads for each role to share the workload



CHEM-E-CAR OVERVIEW

- AIChE (**American Institute of Chemical Engineers**)
- Professional organization for chemical engineers in North America
- AIChE organizes the annual Chem-E-Car competitions (regionals and nationals)
- **FREE** membership for undergraduate students. Why register?
    - Access to educational videos and industry updates
    - Student membership required for participation in AIChE conferences and Chem-E-Car competitions
    - Link to register: **http://www.aiche.org/community/students/student-membership**

CHEM-E-CAR COMPETITION

OBJECTIVE

Design a shoebox-sized car that will accurately travel a certain distance while carrying a specified weight of water.

This is not a race. Competition is about accuracy, not speed.

CONSTRAINT 1

Car must **start and stop** using only chemical reactions. That means no timers, video cameras, remote controllers etc.

CONSTRAINT 2

The car's **motor** must be **powered** using only chemical reactions. Can be pressure-based, electrochemical-based etc.

No commercial batteries allowed for the motor, but can be used to power Arduinos, sensors or other electronics.

CONSTRAINT 3

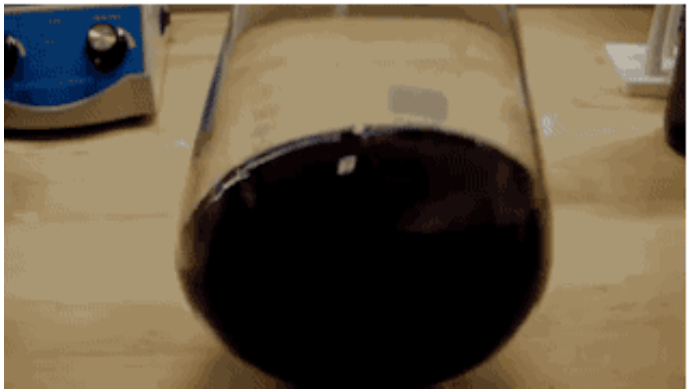
Distance and weight of water: not given until an hour before the competition.

CHEMICAL CLOCK

Chemical clocks control how far the car moves. Clock timing manipulated by concentration, pressure etc.

EXAMPLE: Iodine clock

- Two solutions, A & B
(both colorless initially, black after mixed)
- Time needed to change color
dependent on concentrations of A and B
- Color change measured by
light sensors and cuts off circuit

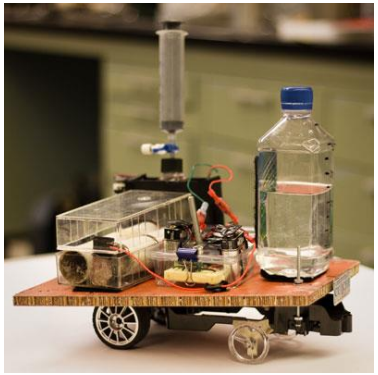


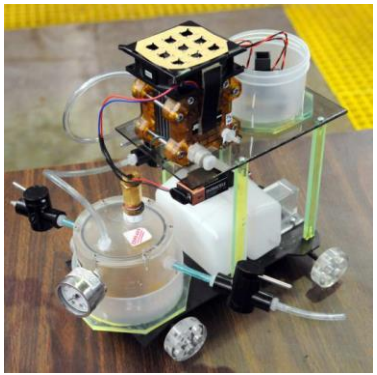
POWER SOURCES

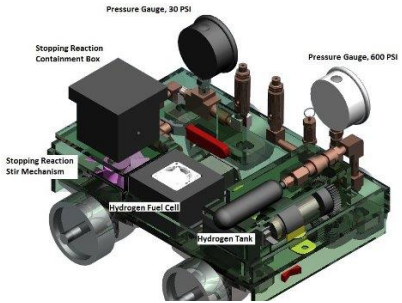
- Pressure tanks, Batteries, Fuel cells
- **Biological reactions**

  AIChE is offering a special $1,000 award for

  “Best Use of a Biological Reaction to Power a Car”



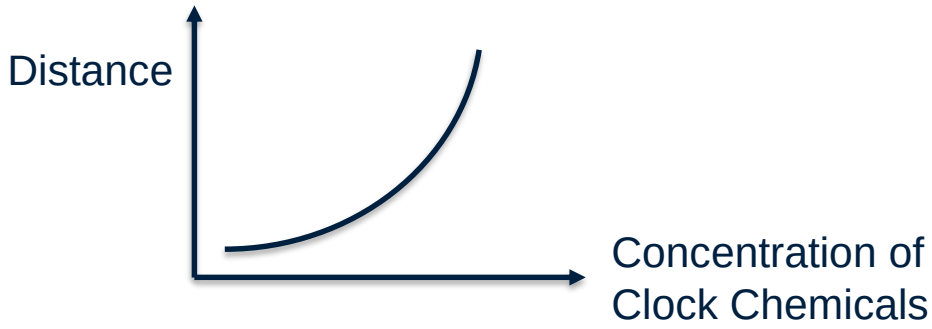




BEFORE THE COMPETITION

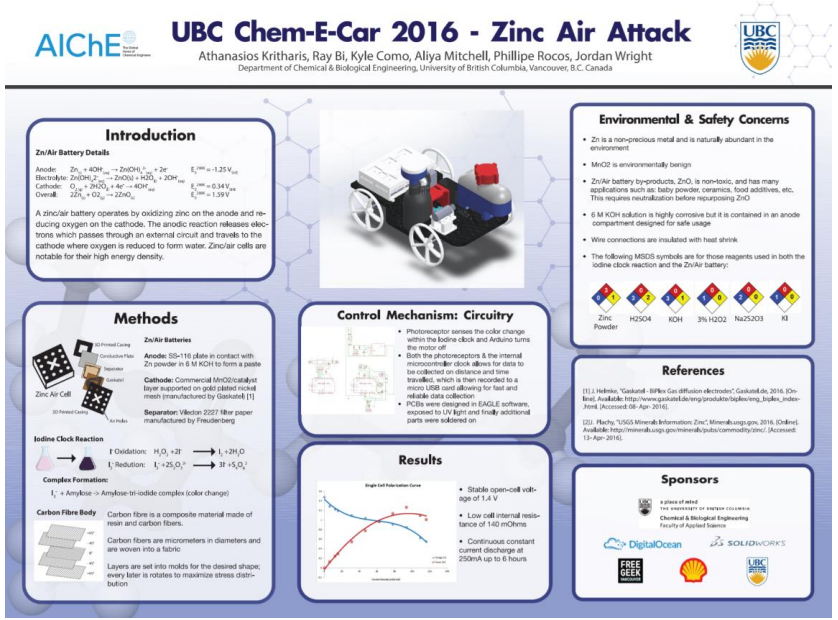
- **Prepare and submit an Engineering Documentation Package (EDP) to AIChE for inspection. [TIP: APPOINT AN EDP MANAGER!]**
  Very detailed document on all aspects of the car including chemical reactions, chemicals used, safety considerations, electronic components etc. Easily 60+ pages including electronics specs sheets, MSDS and other appendices.

- **Test the car and collect data. Generate calibration curves.**

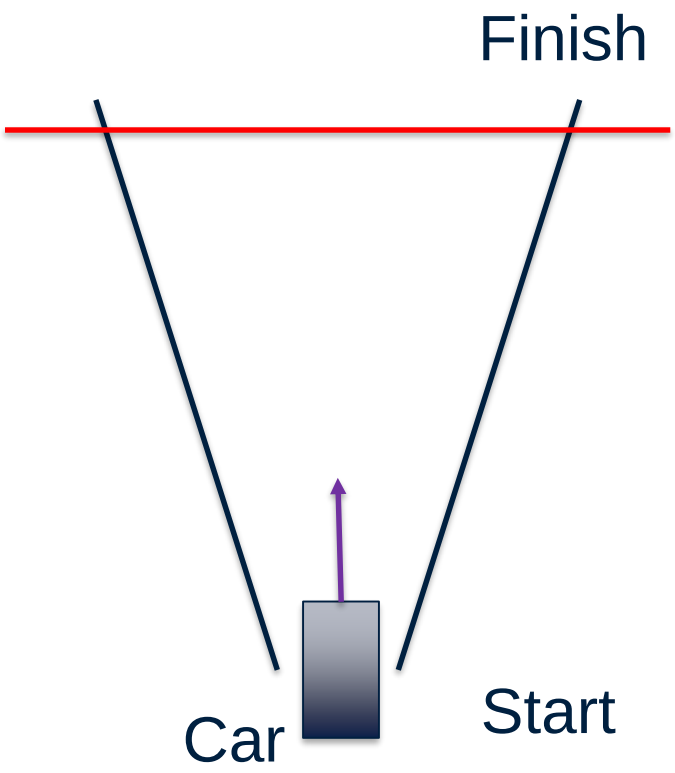


BEFORE THE COMPETITION

- Make a research poster explaining how the car works and the reactions used
- Poster will be presented to the judges during the competition. Award available for best poster presentation.



COMPETITION DAY



- Teams given **15 minutes** to prepare batteries + clock chemicals. *Important to have a battery and clock that's easy and fast to assemble*
- V-shaped markings on the floor. Disqualified if car runs outside the markings. *Mech team: make sure car moves in a straight line*
- Teams scored by measuring distance from the front of the stopped car to the finish line. Team with smallest distance wins!

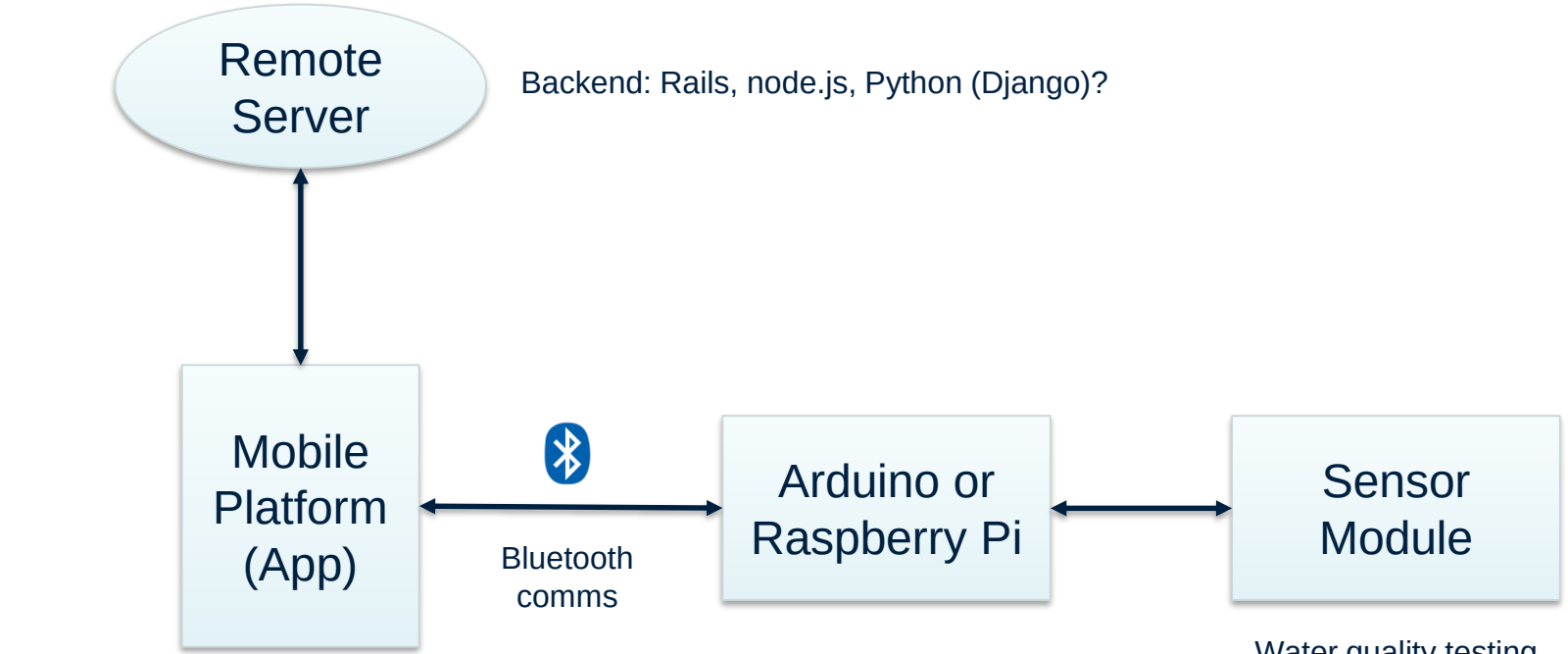
APP COMPETITION RULES (FROM THE AICHE WEBSITE)

- APP must be useful for an AIChE member.
- Possible application areas: **scientific**, **engineering**, **teaching** and **professional meeting organizers.**
- For example, teaching apps could include a game designed to teach chemical engineering concepts.

Suggested features of a winning APP

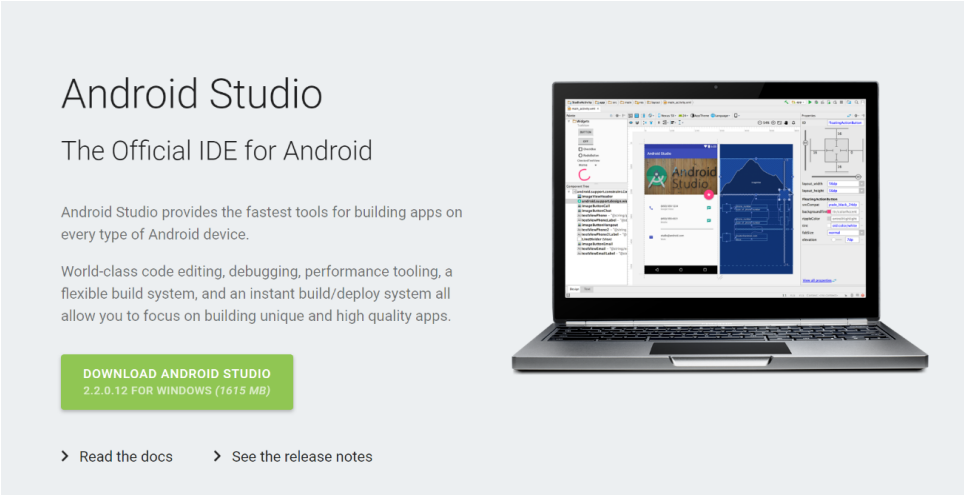
- APP enhances student or professional performance/quality of life.
- APP is built using high quality content of ChE/Chemistry/Engineering
- APP functions with few to no errors
- APP should be more than just a handbook
- APP may be a game to promote chemical engineering to society

CURRENT IDEA: WATER QUALITY TESTING APP



GETTING STARTED: ANDROID

- Learn some basic Java
- Download **Android Studio** from android.com
- Read the tutorials on **https://developer.android.com/training/index.html**



ACTION ITEMS: BATTERY AND CHEMICAL TEAM

Battery and chemical clock proposals (the sooner the better):

- Will give lab access when we receive solid and detailed proposals
- Team leads work together with your members to choose the best proposals (or top 3? If you have multiple good proposals)
- We will help you order chemicals when you are ready!

If you need help or feedback from the senior team, talk to **Andy**, **Mani**, **Arjun**, **Negar** or **Ray**

ACTION ITEMS: JUNIOR MEETINGS

- Senior team will be busy with Nationals car for the next few weeks.

- But we will be around to help if you have any questions. We'll give some 1-hour tutorials on certain Saturdays (will notify junior captains in advance), but we'll mostly be working in the workshop or lab during meetings.

- **Junior captains and team leads will serve as meeting chairs for future meetings.** Can plan your own meetings, or have it the same time as us (Wednesday 6pm, Saturday 12pm) for convenience.

Junior captains email: juniorlead@ubcchemecar.com

NEXT STEPS?

- Break into groups, talk to team leads and figure out next steps and timeline.

- No team leads yet? Take initiative and volunteer yourself!
  Want to be co-lead? Welcome aboard!
  Talk to junior captains.

- Need people to volunteer for administration, talk to junior captains:
  - Documentation manager – EDP and Poster
  - Finance manager (coordinate with team leads, prepare budgets)
  - Workshop manager
    (make sure work space is clean and that everyone is working safely)
  - Any other roles you can think of? Or add more when needed


a place of mind
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