Gesture Controls for Raven Robot

Group 7 Checkpoint Presentation
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Overview

- Goal
- Deliverables
- Progress: 3Gear to CISST
- Progress: CISST to ROS
- Progress: ROS to Raven/Simulators
- Milestones
- Timeline
- Dependencies

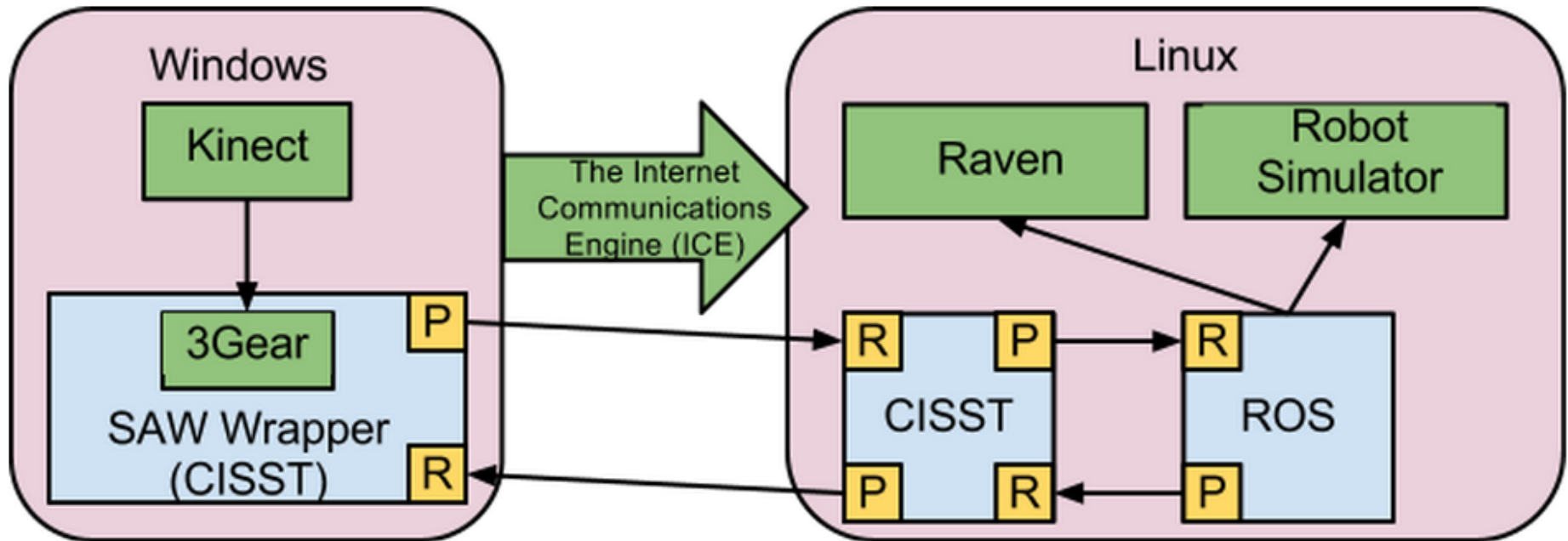# Project Overview

Implement Gesture Controls for Raven Robot

image from popular mechanics

Image courtesy of 3Gear

System Block Diagram

Status of Deliverables

Minimum:

- SAW wrapper for 3Gear: **Late (2 weeks), expected April 15**

- cisstToRos interface: **Late (2 weeks), expected April 15**

- Simple frames moving in Rviz: **On Track (April 19)**

Status of Deliverables

Expected:

- Code to integrate all stages (3Gear to CISST to ROS to simulator): **On Track (April 26)**

- Demonstration that 3Gear moves Raven Simulator: **On Track (April 26)**

Status of Deliverables

Maximum:

- Move Raven Robot using gesture controls:
On track (May 3)

Progress: 3Gear

- ## 3Gear Setup told us a lot:
  - ### Database of poses: pinch, grab, open hand (L, point, OK)

- ## Examples told us a bit more:
  - ### Client/Server protocol integrates well with CISST

- ## SAW wrapper will be light

Progress: cisstRos

- Some installation problems (Ubuntu VirtualBox, cisstRos)

- cisstRos does not build

Progress: ROS - Sim

Options for Raven Simulation:

- ## Simple Gazebo model
  - as a simplified version for our minimum deliverable, this might not look like the Raven
- ## RViz
  - Full Raven model provided by University of Washington
  - May be easier to work with

We may use the Raven Controller, and write a controller that emulates the Raven in Rviz

Progress: ROS - Raven

- Gained access to Raven Computer

- Currently troubleshooting controlling the robot

Milestones

~~April 1~~ April 15 - 3Gear to CISST - Kristine

~~April 1~~ April 15 - CISST talks to ROS - Alan

April 19 - ROS talks to Simulator - Both

April 26 - 3Gear to Simulator - Both

April 29 - ROS talks to Raven - Both (max)

May 3 - 3Gear to Raven - Both (max)

Timeline (previous)

| | | February | | | | | March | | April | | | | May | |
		Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13	Week 14	Week 15
	Deliverable													
3Gear to CISST	Install 3Gear (Kristine)	■												
	Install CISST (Both)		■											
	Code! (Kristine)		■	■	■	■								
	Milestone Validation (Both)							■						
CISST to ROS	Access Linux Machine (Alan)		■											
	Install CISST on Machine (Both)		■											
	Install ROS (Both)		■											
	Code! (Alan)		■	■	■	■								
	Milestone Validation (Both)							■						
ROS to Raven Simulator	Acquire/Install Raven Simulator (Both)					■								
	Code! (Both)								■	■	■			
	Milestone Validation (Both)											■		
ROS to Raven Robot	Access to Raven Robot + Controlling Computer									■				
(Maximum Deliverable)	Code? L2Robot?										■	■		
	Milestone Validation												■	
System Integration	3Gear to ROS - Networking/Setup							■						
	3Gear to ROS - Validation/Debugging									■	■			
	3Gear to Raven Simulator - Validation/Debugging											■	■	
	3Gear to Raven Robot - Validation/Debugging													■

Timeline (Current)

		February			March					April			May	
		Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13	Week 14	Week 15
	Deliverable						■							
3Gear to CISST	Install 3Gear (Kristine)	■	■				■							
	Install CISST (Both)		■				■							
	Code! (Kristine)			■	■	■	■		■	■				
	Milestone Validation (Both)						■			■	■			
CISST to ROS	Access Linux Machine (Alan)		■				■							
	Install CISST on Machine (Both)			■			■							
	Install ROS (Both)				■	■	■							
	Do ROS Tutorials						■	■						
	Code! (Alan)						■		■	■				
	Milestone Validation (Both)						■			■				
ROS to Rviz	Acquire/install Rviz						■	■						
(Minimum Deliverable)	Command Rviz models with ROS						■		■	■				
ROS to Raven Simulator	Acquire/Install Raven Simulator (Both)						■	■						
	Find out how Raven is controlled						■		■					
	Write controller for Raven Simulator						■			■	■	■		
ROS to Raven Robot	Access to Raven Robot + Controlling Computer						■	■						
(Maximum Deliverable)	Write controller for Raven						■				■	■		
	Milestone Validation						■						■	
System Integration	Software Design + Validation				■	■	■							
	3Gear to ROS - Networking/Setup						■			■				
	3Gear to ROS - Validation/Debugging						■				■	■		
	3Gear to Raven Simulator - Validation/Debugging						■					■	■	
	3Gear to Raven Robot - Validation/Debugging						■							■

Dependencies

Access to 3Gear Computer

- **Resolution Plan:** Get J-Card access, ask Kell for access
- **Resolve by:** February 15
- **Resolved: YES**

Learn to build CISST

- **Resolution Plan:** Meet with Anton to help us
- **Resolve by:** February 22
- **Resolved: YES**

Access to Linux Machine for ROS and Raven Simulator

- **Resolution Plan:** Kell finds us a Linux machine to work with
- **Resolve by:** February 22
- **Resolved: YES** - Work on laptops

Dependencies

Networking between 3Gear (Windows) machine and ROS/Raven (Linux) Machine

- **Resolution Plan:** Ask mentors for help
- **Resolve by:** March 25
- **Resolved: No**
- **New plan:** Resolve by April 10 (mentors have agreed to help)

CAD models and/or actual Raven Simulator

- **Resolution Plan:** These should be available through the Raven community
- **Resolve by:** March 15
- **Resolved: YES**

Access to Raven Robot + Control Computer

- **Resolution Plan:** Ask Kell for access
- **Resolve by:** April 15
- **Resolved: YES**

New Dependencies

Build cisstRos

- **Resolution Plan:** Ask mentors for help
- **Resolve by:** April 3
- **Resolved: No**
- **Fallback Plan:** None, critical

Install ICE on computers to be used

- **Resolution Plan:** Ask Kel (he has admin for the computer)
- **Resolve by:** April 10
- **Resolved: No**
- **Fallback Plan:** None, critical

Learn how Raven is controlled

- **Resolution Plan:** Troubleshoot with Kel
- **Resolve by:** April 3
- **Resolved: No**
- **Fallback Plan:** None, affects expected and maximum deliverables

Thank you!

Questions?