Autonomous Snowplow Competition

ION North Star Section
Outreach Program

Autonomous Snowplow Committee

Final Presentation Information & Outline

2013-14 Competitors

December 2013

Final Presentation Rules

- Final Presentation slides must follow the provided outline
  - Standardize judging for all Teams
  - ASC Committee hint:
    - Teams will not score points if sections of the given outline are not addressed
- Final Presentation slides (initial draft) submission deadline
  - 20 January 2014
  - Time: 12 pm (noon) Central
  - Email submission: vibhor.bageshwar@honeywell.com
  - Please submit a PDF version of the presentation to minimize file size
- Final Presentation Day: 23 January 2014 (Thursday)
  - Final Presentation Venue: Science Museum, Saint Paul, MN
  - Final version of the Final Presentation slides must be delivered to Vibhor by 4:30pm on January 23 at the Final Presentation Venue
    - Final presentations will be hosted using the Science Center's A/V equipment and Vibhor's Laptop
    - Supported media: standard Microsoft applications or Adobe Acrobat format

Final Presentation Rules

- Final Presentation time: each Team is allotted 20 minutes
  - Team Presentation order will be determined by random draw at 4:30 pm on 23 January 2014 at the Final Presentation Venue
  - First Team Presentation begins at 5:25pm on 23 January 2014
  - Presentation time: 15 minutes maximum
  - Q&A time: 5 minutes maximum

- Team scoring
  - Final Presentation scoring is independent of Final Reports
  - Team standings will be updated by 25 January 2014
    - Website
      www.autosnowplow.com
    - ASC Scoring Board at the Competition Venue

Final Presentation Outline

- Title Slide (1 slide)
  - Team university/name/logo
- Objectives (1 slide)
  - Team objectives
  - Team composition
- Snowplow Vehicle Program Top-Level Requirements (1 slide)
  - Table format
  - ASC Committee hint: a requirement is a metric that indicates when a design satisfies an objective
    - Ex: Heading angle accuracy: 0.25 deg
- Snowplow vehicle plowing strategy (minimum 1 slide)
  - Single “I”
  - Triple “I”

Final Presentation Outline

- Snowplow Vehicle Description (please follow the given order)
  - Concept/Plowing strategy (1 slide)
    - ASC Committee hint: address how vehicle will satisfy plowing strategy from a top level
  - Snowplow vehicle design (minimum 1 slide)
    - Snowplow vehicle and blade design
    - Snowplow vehicle physical dimensions
    - Sensor + processor component housing
  - Navigation system design (minimum 1 slide)
    - Concept
    - Sensors
    - Navigation augmentation system
      - Placement of navigation aids in competition field
  - Guidance system design (minimum 1 slide)
    - Way-point selection concept
  - Control system design (minimum 1 slide)
    - Concept & available actuators
    - Bandwidth & actuator response speed
  - Processor & Software design (minimum 1 slide)
    - Timing and action sequence flowchart

Final Presentation Outline

- Safety System (minimum 1 slide)
  - System description
  - Emergency shut-off options
    - Physical and remote
  - Stopping distance from maximum speed
    - Identify surface
- Failure Modes and Recovery Actions (1 slide)
  - Identify failure mode and recovery actions
  - Table format
- Overall Risk Assessment Summary (1 slide)
  - Evaluate each subsystem
  - Identify known issues
  - Table format

Final Presentation Outline

- Vehicle Design Challenges (minimum 1 slide)
  - Highlight vehicle or system design changes from the existing snowplow vehicle design
    - Teams should indicate whether the vehicle or its systems are pre-existing or newly designed
  - Highlight the design challenges the Team faced while adapting the vehicle and its systems to this year's competition

- Commercialization and Implementation (2 slides)
  - Identify components and their cost
  - Identify snowplow vehicle and navigation aid cost for sale to the general consumer
    - ASC Committee hint: convey cost to a consumer buying the product at the local hardware store
  - Identify steps consumers would follow to set-up the snowplow vehicle and navigation aids in an operating environment
    - Operating environment example: garage and driveway
  - Identify time to set-up the snowplow vehicle and navigation aids in an operating environment
    - ASC Committee hint: convey the ease or difficulty the consumer would encounter setting up the snowplow vehicle and navigation aids
  - Table format

Final Presentation Schedule

Team	Presentation Time (central)
Case Western Reserve University: “Snow-Mower 7”	TBD: random draw at 4:30pm on 23 January 2013
Dunwoody College of Technology: “Snow Devil 0100_2”	
Iowa State University: “SnowClone”	
Miami University: “Red Blade”	
North Dakota State University: “THUNDAR Snowplow”	
University of Michigan-Dearborn: “Geili 3.0”	
University of Michigan-Dearborn: “Yeti”	
University of Michigan-Dearborn: “Zenith”	

Final Presentation Scoring

- Final Presentation scoring: 10% of the total Competition score

Category	Scoring
Technical and Quality of Presentation	200
Ability to Engage Audience	50
Total Points	**250**