Autonomous Snowplow Competition



ION North Star Section
Outreach Program

Autonomous Snowplow Committee



Final Presentation Information & Outline 2015-16 Competitors

December 2015

Final Presentation Rules

- Final Presentation slides must follow the provided outline
 - Standardize judging for all Teams
- ASC Committee hints:
 - Judge's scoring form follows the outline exactly
 - Slide titles should match outline titles
 - Address each section of the outline using at least one separate slide
 - Teams will not score points if sections of the given outline are not addressed
 - Example: presentations that do not address "Vehicle Design Challenges" will receive 0 points for that Section
 - Use Figures and Tables to convey requirements, strategy, designs, and costs

Final Presentation Rules

- Final Presentation slides (initial draft) submission deadline
 - 25 January 2016
 - Time: 12 pm (noon) Central
 - Email submission: <u>vibhor.bageshwar@honeywell.com</u>
 - Please submit a PDF version of the Presentation to minimize file size
- Final Presentation Day: 28 January 2016 (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 28 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

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Final Presentation Rules

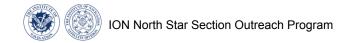
- Final Presentation time: each Team is allotted 20 minutes
 - Team presentation order will be determined by random draw at 4:30 pm on 28 January 2016 at the Final Presentation Venue
 - First Team Presentation begins at 5:30 pm on 28 January 2016
 - Presentation time: 15 minutes maximum
 - Q&A time: 5 minutes maximum
- Team scoring
 - Final Presentation counts 15% toward the final Competition score
 - Team standings will be updated by 30 January 2016
 - ASC Scoring Board at the Competition Venue

- 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
 - Hint: a requirement is a number that indicates when a design satisfies an objective
 - Hint: highlight the top-level requirements that indicate the snowplow vehicle design is completed
 - Snowplow vehicle plowing strategy (minimum 1 slide)
 - Single "I"; Triple "I"
 - Hint: address vehicle strategy to plow snow, avoid obstacles, and return to garage
 - Hint: address plowing concept strategy minimize plowing time, maximize snow removal, avoid or run over obstacles, etc.



- Snowplow Vehicle Description (please follow the given order)
 - Snowplow vehicle design (minimum 1 slide)
 - Snowplow vehicle and blade design
 - Snowplow vehicle physical dimensions
 - Sensor & processor component housing
 - Hint: address temperature control
 - 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
 - Hint: given navigation system, describe how snowplow vehicle will generate its plowing path, avoid obstacles, and perform its functions
 - Control system design (minimum 1 slide)
 - Concept & available actuators
 - Bandwidth & actuator response speed
 - Processor & Software design (minimum 1 slide)
 - Timing and action sequence flowchart
- Use figures to describe the vehicle systems and design ION North Star Section Outreach Program

- Safety System (minimum 1 slide)
 - System description
 - Figure format
 - Hint: show how power is cut off to the vehicle
 - 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



- Snowplow Vehicle Design Challenges (minimum 1 slide)
 - Highlight vehicle or system design changes from the existing designs
 - Teams should indicate whether the vehicle or its systems are pre-existing or newly designed
 - Hint: first year Teams should identify major design decisions
 - Hint: returning Teams should highlight the design challenges the Team faced 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
 - Hint: convey cost to a consumer buying the product at the local hardware store; companies charge more for products than material + labor cost
 - 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
 - Hint: convey the ease or difficulty the consumer would encounter setting up the snowplow vehicle and navigation aids
 - Table or figure formats



Final Presentation Schedule

Team	Presentation Time (central)
University of British Columbia: "Snow Flake"	TBD: random draw at 4:30 pm on 28 January 2016
Case Western Reserve University: "OTTO X"	
Case Western Reserve University: "Snow Joke"	
Dunwoody: "Snow Devil 0110_2"	
North Dakota State University: "Snow Blight"	
North Dakota State University: "THUNDAR 2.0"	
University of Michigan-Dearborn: "Yeti 6.0:	
University of Michigan-Dearborn: "Zenith 2.1"	
University of Minnesota: "Ground Squirrel"	
University of Saint Thomas: "John Snow"	

Final Presentation Scoring

Final Presentation scoring: 15% of the total Competition score

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