

48th Annual National Collegiate Landscape Competition
March 13 - 16, 2024
Brigham Young University

ROBOTICS AND TECHNOLOGY IN LANDSCAPE DESIGN AND MAINTENANCE

Landscape maintenance is the art and vocation of keeping a landscape healthy, clean, safe and attractive. Very often maintenance is overlooked when the design for a given landscape is created. Landscapes that require more extensive maintenance routines result in higher labor and financial costs for property owners. In addition to these costs, the human and environmental impact of maintenance with traditional tools should also be considered.

Description: Students (maximum of two per school) will be required to answer a series of questions and/or problems related to sample residential and commercial projects. Some drawing and design calculations may also be required. Questions will be objective in nature.

1. Demonstrate understanding of robotic mower installation requirements by identifying the best possible solution for given properties (Commercial and Residential). Sketch and identify all components necessary to complete installation. Plans should appropriately consider property size and installation criteria, passage dimensions, separate/disconnected maintenance areas, obstacles and other landscape design features.
2. Determine, from a given set of examples, what commercial properties would benefit most from the use of robotic mowers. Identify the potential benefits for each site.
3. Rank provided landscape designs from most to least suitable for autonomous lawn maintenance. Identify obstacles to installation and utilization. Provide suggestions on how each could be modified to increase coverage of robotic deployment, without significantly impacting the original design intent.
4. Identify sources, pollutants, impacts and effects of gas-powered maintenance equipment on people, communities, and the environment. Calculate impact on environment for current and alternative landscape maintenance technologies.
5. Understand and review new technology in the robotics space and identify the best use scenario for these new additions to the robotics space.

Time: 1 hour and 50 minutes

Limits: The sponsor reserves the right to limit the number of individuals competing based on space constraints. Schools will be able to compete based on the date their registrations were received and paid. Registrations that are received late or have not been paid will be placed on a waiting list.

JUDGING CRITERIA

Points: 100 possible points for the individual score; individual scores are combined toward the team score for a total of 200 possible points.

Points will be assigned based on the following criteria:

Solutions will be scored against a pre-determined solution. Time will be used only as a tiebreaker.

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Students are required to bring the following materials to the event:

Calculator
Engineer and Architect scale
Pencils with erasers
Scratch paper

Sponsor is required to supply the following materials for the event:

Copies (appropriate number) of test materials (questions, explanations, etc.) and multiple choice answer sheets
Stopwatches
Sufficient number of judges and event monitors
Final solution ready for scoring the students solutions

Study Guides:

Husqvarna Operators Manuals for 535AWD & 435X AWD

<https://www.husqvarna.com/us/search-results/?groups=DOCUMENTS&q=535AWD>

Husqvarna Automower Installation Video

<https://youtu.be/tB3LHIXqBoY?si=73Cyw7bpDZPX8BG4>

<https://youtu.be/ae3RWQiP9v8?si=oigHE-RdhCjh-CtR>

<https://youtu.be/AXoBMumIUjE?si=ebD9ARlvyTmPz2sG>

https://youtube.com/playlist?list=PL0VcazyXHqErdOxSjAK13Q4zHXPsqJCWL&si=7L_0f32mhgp1ole9

Husqvarna EPOS and CEORA video

<https://www.youtube.com/watch?v=uOlyBuSdXhc>

<https://youtu.be/OKMwCcBrEdI?si=UR8GzFOXwP5kf6IJ>

https://youtu.be/Vqkqng_9h0c?si=lalmUIkSIF2eqyK6

Husqvarna Automower Answers & Resources

<https://www.husqvarna.com/us/products/robotic-lawn-mowers/>

<https://www.husqvarna.com/us/discover/robotic-mowers/automower-how-it-works/>

<https://www.husqvarna.com/us/discover/epos/>

Environmental Impact

<https://ww2.arb.ca.gov/resources/fact-sheets/sore-small-engine-fact-sheet>

<https://www.themomentum.com/articles/how-gas-powered-lawn-mowers-are-bad-for-the-environment-and-what-to-do-about-it>

<https://www.epa.gov/sites/default/files/2015-09/documents/banks.pdf>