

# EAAI Not-so-grand Challenge (NSG '17)

## Motivation

Sharing AI Robotics curricula is difficult.

As a result, 2017's EAAI Not-So-Grand (NSG) Challenge challenges individuals or teams to devise an adaptable, enlightening, and accessible AI task with an embodied, robotic component.

On one hand, robotics has long offered students a compelling foundation for building AI systems:

- for some, they are a naturally motivating context for open-ended AI problems
- robotic systems benefit from solutions to many classical and modern AI problems – and can motivate creative variations of those problems and solutions
- such systems involve real – and often really noisy – sensory data from which discrete decisions need to be made
- they can leverage creative backstories and point to diverse applications in their (potential) positive impacts
- embodied systems can offer problems with multiple pathways to successful solutions, e.g., keener sensing and/or keener algorithms
- robotics projects often motivate both coordination and specialization within student teams

Yet despite these benefits, robot challenges can require time or expertise out of alignment with the undergraduate AI experience:

- many robotics tasks require too much or too specialized a background for undergraduate teams to tackle as part of a classroom experience or summer project
- some need too large or too sustained time commitment for classroom/summer use
- some need hardware that is prohibitively expensive or that requires unusual expertise
- many robotics projects do not overlap closely with AI, e.g., they emphasize mechanical design or continuous-control and de-emphasize software structures and task-specific reasoning

## The Challenge

Directly supporting EAAI's principal focus – adaptable, effective resources for AI education – the 2017 NSG challenge invites *creating an accessible curricular module that engages students in both AI and robotics*. In a sense, this is a meta-robotics challenge, in which you're invited to create an AI robotics task that maximizes both curricular value and ease of deployment.

There are no constraints on the hardware, software, or curricular content of the tasks submitted: *every* choice will confront tradeoffs relative to the judging criteria noted below. All target educational levels and all possible team compositions are invited: students, educators, researchers, everyone.

In keeping with EAAI's focus, this challenge especially targets *undergraduate-level* tasks and curricular goals in particular. NSG submissions targeting other audiences are welcome, too: they will be considered in their own category. Further, in the spirit of supporting the undergraduate experience, we encourage submissions by undergraduate students and faculty, working together as a team of equal contributors.

Details are available at <https://www.cs.hmc.edu/~dodds/nsgc17>

## Submitting

A submission to the NSG Challenge consists of three parts:

- a written report of 2-6 pages, with EAAI formatting (at least in its final form), describing the task or program created, including sections on

- the "challenge" task itself, as well as the student audience it's meant for
- the hardware and software required to tackle the challenge
- the AI and programming skills the challenge elicits and reinforces
- the experiences of the authors in trying out the challenge -- or in others' trials of it
- [optional] we invite submission to include links to one or more videos, documenting end-to-end executions of the challenge or other facets appropriate to it
- [at EAAI] a presentation, made by one or more team members at EAAI
  - this will be a ~10-minute overview interlacing the challenge itself and its motivation, the materials and background needed, the AI content addressed, and the insights gained from the one or more trials run

These deliverables are deliberately vague and open-ended: we welcome all ideas! Note that these are essentially curricular submissions – *not robotics systems* per se. This challenge is at heart pedagogical/curricular, not technological per se.

EAAI will archive all submissions for educators to adopt/adapt in the future.

## Judging

There will be at least three judges who review all of the submissions. They will rate each of the proposed robot curricular tasks by asking the following questions. For each of these criteria, more would be better:

- how well-pitched is the learning curve for the intended audience of students?
- how well and how deeply is AI integrated into the students' contributions to the project?
- how accessible is this project for other educators and institutions to adopt or adapt?
- how open-ended, especially in terms of AI content and application, is the challenge?
- how compelling would this challenge be for a wide audience of the intended ages, i.e., how little specialized background is needed, in terms of hardware/software/languages/libraries?
- how well does the submission incorporate software and tools widely used in the professional AI/robotics communities?
- how much value-added can students contribute to the task's starting scaffolding?
- how much sophistication and freedom, both in sensing and in processing sensor data, does the challenge make available for student exploration and investigation?
- how thoroughly and engagingly is the submission presented at EAAI 2017?

Wait ~ these criteria are all mutually contradictory... . It's impossible to meet all of them!

**Yes. Welcome to the challenge!**