

Odor Tracking with an Electronic Nose

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Table of Contents

Title	Page Number
1. Progress Made During Last Two Weeks	3
2. Individual Achievements	3
3. Plans for Next Two Weeks	3
4. Problems Encountered	4
5. Assistance from TA/Instructor	4

Progress Made During Last Two Weeks

We have made significant progress towards the completion of our project over the past two weeks. We integrated the simulation code with the E-nose dilution system, and began testing. We synchronized all our graphics and displays to display correct representations of what is happening. We completely recoded our robot algorithm and fine-tuned it to create a sleek, svelte, odor-tracking kill-bot. It is easily tweaked and modified to produce optimal results. We also changed the dilution system to dilute in series, producing a greater range of possible concentrations. We have begun collecting data regarding the time it takes to achieve an accurate sensor response, given certain conditions, and this data will aid in finishing our project.

Individual Achievements

- Greg and Ninh worked together on the dilution system, gathering data about how the sensors react to increases and decreases in concentration over certain periods of time.
- Simon and Jason worked together to recode the odor-tracking algorithm. The new algorithm has a “momentum” term built in, so that it has a tendency to travel in the same direction it was traveling at every step. It also has a “memory” term built in which remembers the point of highest concentration it has encountered so far and tends towards that point.

Plans for Next Two Weeks

In the next two weeks we are planning on doing the following:

- Determine the required sensing times to acquire an accurate reading from the dilution system
- Determine the proper heater voltage profiles to achieve the optimal results from the dilution system.

Problems Encountered

Over the past two weeks, we have encountered several problems that we had not anticipated. Recoding the algorithm proved to be both a difficult conceptual task, as well as a challenging programming job. We had to consult Steve about how to properly code it, because our first attempt failed miserably. The dilution system also lost a sensor, which makes it a little less accurate. However, all of these problems have been solved.

The greatest problem we are currently facing is getting accurate results from the dilution system. Currently, the dilution system produces varying results as it heats up. It also retains some of the analyte from the last sensing period, and this left-over analyte corrupts the reading the next time.

Assistance from TA/Instructor

These past two weeks, we received help from Marco concerning the following:

- Augustin helped Ninh and Greg figure out how to test the existing E-nose system.
- Steve helped us implement and debug our moving average algorithm.