

# **Odor Tracking with an Electronic Nose**

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Simon Saugier  
Greg Allbee  
Ninh Dang  
Jason Hamor

Instructor: Dr. Ricardo Gutierrez-Osuna

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## **Progress Made During Last Two Weeks**

In the last two weeks, we have begun to code and test our modules. The Gaussian dispersion model has been coded, and is able to position the odor source and wind direction anywhere the user desires. It also produces a graphical output, which is quite impressive. Some modifications are still necessary to deal with certain exceptions and boundary conditions. The E-nose simulator has been coded and tested, and is working properly. The robot has begun to be coded. It is suffering from slight mental retardation, and we may need to rework the algorithm. At any rate, it produces semi-correct output, and more work is needed. We are not sure what the error is at this time, but we will continue to research the situation.

## **Individual Achievements**

- Simon coded the Gaussian dispersion in C, and interfaced it with LabVIEW with Greg's help. Simon helped Ninh code the tracking algorithm for the robot.
- Greg researched graphics in LabVIEW. He also helped everyone create projects that could interface with LabVIEW. Recently, he has been working with Ninh on the odor-tracking algorithm for the robot.
- Ninh designed and coded the odor-tracking algorithm for the robot simulator, and made it work with LabVIEW. Simon assisted him in this stage.
- Jason coded the E-nose simulator and made it work with LabVIEW. He also assisted in graphically representing the dispersion model and the odor-tracking algorithm. Recently, he has been working on converting the concentration into a dilution profile to be used with the machine upstairs.

## **Plans for Next Two Weeks**

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

- Correct the odor-tracking algorithm.
- Correct the dispersion model.
- Integrate the odor-tracking graphics with the dispersion graphics.
- Test dilution profile.
- Create a module that will interpret sensor responses.
- Create a module that will convert sensor responses to concentrations.

## **Problems Encountered**

We have encountered several problems within LabVIEW. We don't understand how the intensity graph that we are using to display our dispersion model works, and there is no documentation on it. This makes it very difficult to super-impose our robot's motion onto this image. We are also experiencing difficulties using the charts. We cannot get the axis to remain constant between runs. This makes it difficult to determine what is happening between stages of the odor-tracking phase.

The availability of necessary software has been a problem. LabVIEW used to only be on one computer in the 218 lab. Now it is on two, which helps. There is a problem switching between versions of LabVIEW as well. The machines in the 218 lab are running version 5.1, which can convert to 6.1 fairly easily (the dilution system is using version 6.1), but converting from 6.1 to 5.1 is impossible. This causes some major problems when the 520 lab is closed, because we cannot open our LabVIEW programs.

The odor-tracking algorithm is not performing as we had expected. We are not sure if this is due to a faulty algorithm, or to faulty programming. It is difficult to debug, because we cannot use a debugger on the C code. We have to “play computer” and step through the code ourselves, which is tedious and difficult, and often we end up with different answers than the computer. We hope to solve this problem within the next week.

### **Assistance from TA/Instructor**

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

- Marco installed LabVIEW for us on another computer, so that we could all be pair-programming at once.