



2003 Annual Review of  
**AFRL/VA and AFOSR**  
supported



**The Ohio State University**

**Collaborative Center of Control Science (CCCS)**



Thursday-Friday, November 13-14, 2003

Agenda for the 2003 Annual Review of the  
AFRL/VA and AFOSR supported  
The Ohio State University

**Collaborative Center of Control Science (CCCS)**

Thursday-Friday, Nov. 13-14, 2003

**Thursday, Nov. 13: The Blackwell, Pfahl Executive Conference Center,  
Rm. 140 Pfahl Hall**

**Project Reports and Poster Sessions**

7:15am Registration and Continental Breakfast

8:00am Opening Remarks  
Siva Banda

8:15am Welcome and CCCS Overview  
Kevin Passino

**Cooperative Control for UAVs:**

9:00am Cooperative Control of Networked UAVs  
Kevin Passino

9:30am Markov Chain Models for Persistent Area Denial Problems  
Joe Cruz

10:00am Break

10:30am Distributed Task Assignment for Cooperative Search and Engagement  
by UAV Teams  
Ali Minai and Marios Polycarpou

11:00am Multivehicle Cooperative Search and Engagement with Uncertain  
Prior Information  
Raúl Ordóñez

11:30am Distributed Sensor Fusion  
Ümit Özgüner

**12:00pm Lunch (on-site)**

## **Aerodynamic Flow Control and Control of Reusable Launch Vehicles:**

- 1:00pm      Closed-Loop Aerodynamic Flow Control  
Mo Samimy
- 2:00pm      Design of Controllers for Closed-loop Aerodynamic Flow Control  
Hitay Özbay
- 2:30pm      Advanced Control Allocation Methods for Reusable Launch Vehicles  
Andrea Serrani and Steve Yurkovich

3:30pm      Break

### **4:00pm      Poster Session: Additional CCCS Projects, Related Projects**

OSU DARPA MICA SHARED Program, Funded by DARPA  
Joe Cruz

Intelligent Off-Road Navigation  
Ümit Özgüner

Using Symbolic Model Checking to Design the Control of a UAV Fleet  
Chris Bohn and Bruce Weide

Robust Control of Mobile Robot Formations  
Xingping Chen, Hitay Ozbay, and Andrea Serrani

Cooperative Control Testbed Overview  
Keith Redmill and Ümit Özgüner

Mobile Target Tracking by Networked Uninhabited Autonomous Vehicles via  
Hospitality Maps  
Shreecharan Kanchanavally, Raúl Ordóñez, and Jeff Layne

Robustness Study of the Dynamic Inversion Based Indirect Adaptive Control of  
Flight Vehicles with Uncertain Model Data  
Rama Yedavalli

Distributed Control for Satellite Clusters, Funded by CCCS and NASA  
Trevor Williams

- 5:30pm      Cocktails and Hors d'oeuvres  
The Blackwell, Ball Room Lobby (second floor)
- 6:30pm      Dinner (on site)  
The Blackwell, Banquet/Ball Rooms A& B

**Friday, Nov. 14: Aeronautical and Astronautical Research Laboratory (AARL)  
Gas Dynamics and Turbulence Laboratory (GDTL)**

**Demonstrations and Evaluation**

- 9:00am Continental Breakfast, Conference Room, GDTL, Rm. 100
- 9:45am Demonstrations for Executive Board: Closed-Loop Flow Control
- 10:30am Demonstrations for Attendees: Closed-Loop Flow Control
- 10:30am CCCS Executive Board Meeting (closed meeting),  
Conference Room, GDTL, Rm. 100
- 11:30am CCCS Executive Board Feedback to CCCS Investigators  
(open meeting), Conference Room, GDTL, Rm. 100
- 12:00pm Meeting ends

## Directions and Accommodations

AFRL/VA and AFOSR supported

The Ohio State University

## Collaborative Center of Control Science (CCCS)

### Hotel Information

**The Blackwell**                      <http://www.theblackwell.com/about/>  
2110 Tuttle Park Place  
Columbus, Ohio 43210

Phone: 614-247-4000  
Call for reservations, toll free: 866-247-4003

Location: On the east side of Tuttle Park Place Ave. between Lane Ave. and Woody Hayes Dr. See directions below.

**Holiday Inn on the Lane**                      <http://www.holidayinnosu.com/>  
328 W. Lane Ave.  
Columbus, Ohio 43210

Phone: 614-294-4848  
Call for reservations, toll free: 800-465-4329

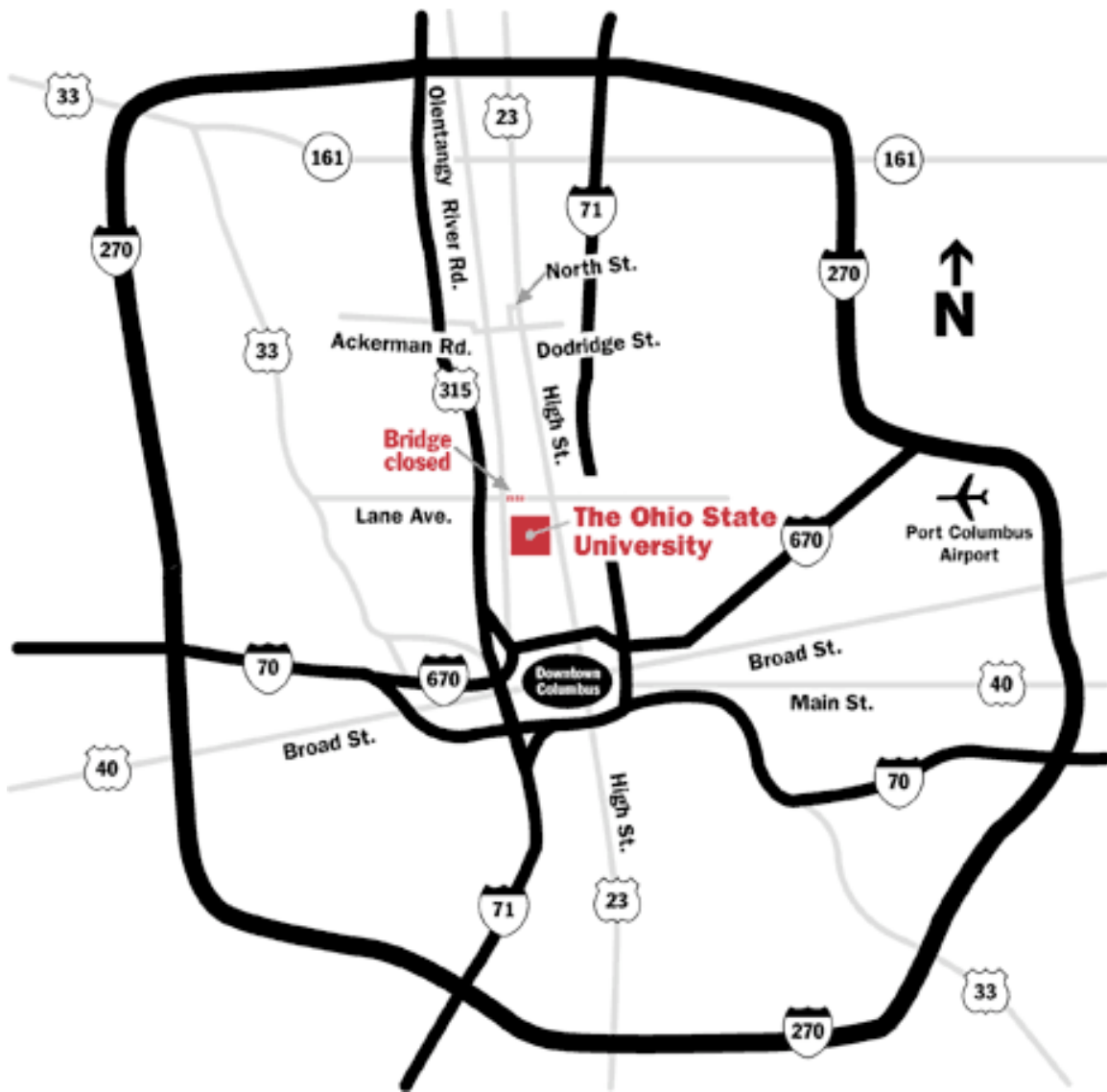
Location: On the north side of Lane Ave., east of 315 (and of Olentangy River Rd.) and just west of Tuttle Park Place Ave. See directions below.

**Alternate Hotel: The University Plaza Hotel** - <http://www.universityplazaosu.com/>  
3110 Olentangy River Rd.  
Columbus, Ohio 43202  
Phone: (614) 267-7461

Location: Go north on Olentangy River Rd. from Lane Ave., about a mile and on right hand side.

For more information on accommodations, see <http://www.osu.edu/visitors/>

## Directions to The Ohio State University\*



There will be a number of construction projects in and around the Ohio State campus in the next few years that will affect the flow of traffic, including one that recently closed Lane Avenue east of Olentangy River Road. Highway signs on SR 315 currently advise motorists to exit at Ackerman Road due to construction on Lane Avenue east. (Although you can still reach some campus destinations by exiting at Lane Avenue off SR 315, you cannot take Lane Avenue any farther east than Olentangy River Road. Below, it is recommended that you use Lane Ave.)

## Directions to OSU Campus:

### From the north:

Take any major highway to I-270. Take I-270 to SR 315 south. From SR 315 south, exit at Lane Avenue and turn left.

### From the south:

Take any major highway to I-71 north. Take I-71 north to SR 315 north. Exit at Lane Avenue and turn right.

### From the west:

Take any major highway to I-70 east. Take I-70 east to I-670 east to SR 315 north. Exit at Lane Avenue and turn right.

### From the east:

Take any major highway to I-70 west. Take I-70 west to SR 315 north. Exit at Lane Avenue and turn right.

### From Port Columbus International Airport:

Take I-670 west to SR 315 north. Exit at Lane Avenue and turn right.

---

\* From OSU Visitor Guide. For more details, if you have access to the web, click [here](#).

## Directions to The Blackwell Hotel and Holiday Inn

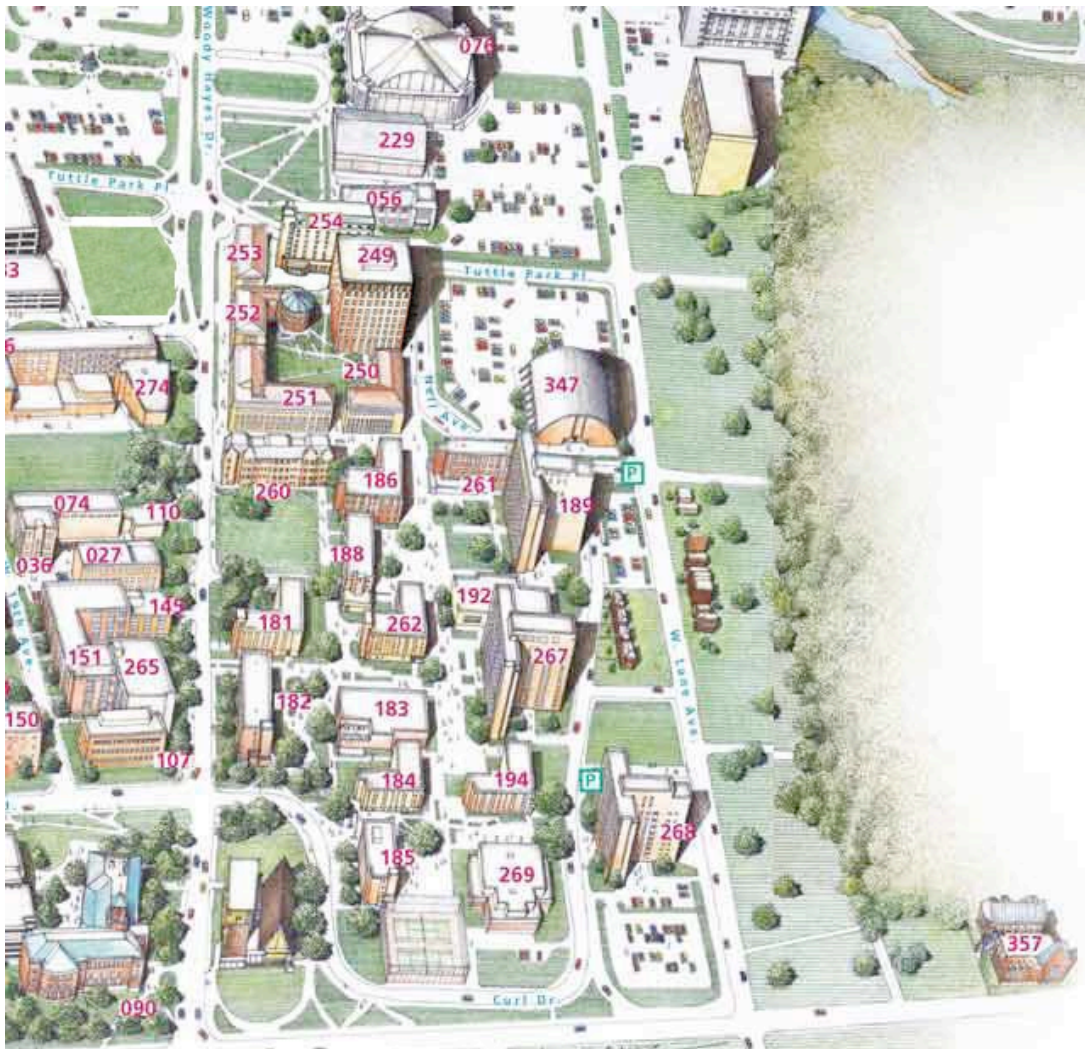
- Go east on Lane Avenue from SR 315.
- **NOTE:** The bridge on Lane Ave. to cross the Olentangy River (at Olentangy River Rd.) is closed (see above map). Hence, you should follow the following route:
- Turn right (south) on Fyffe Rd. off Lane Ave.
- Turn left (east) on Woody Hayes Dr.
- Cross the river and then see the football stadium on your right.
- Turn left on Tuttle Park Place.
- The Blackwell is on the east side of Tuttle Park place, immediately on your right (i.e., at the corner of Tuttle Park Place and Woody Hayes Dr.).
- For the Holiday Inn continue straight on Tuttle Park Place.
- Take a left on Lane Ave. and the Holiday Inn is less than a block down on your right.

[See map below for more details:](#)

The Blackwell is Building 254

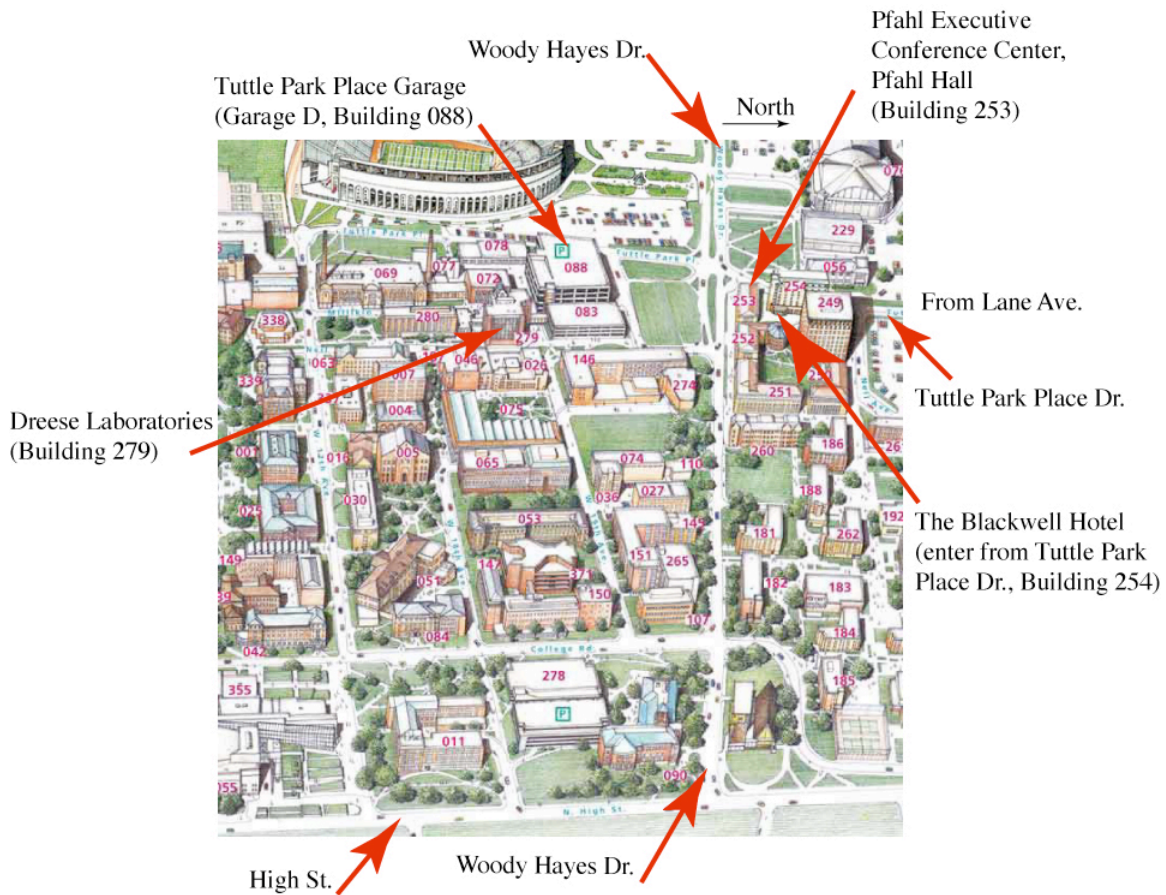
Pfahl Hall, Pfahl Executive Conference Center is Building 253

Holiday Inn on the Lane is the cream and white-topped building in the top-right corner of the map below.





## Locations Relative to Dreese Laboratory, Parking for Dreese Laboratory and The Blackwell:



To get to Dreese Laboratories, and parking use the valet parking at The Blackwell, or go to Tuttle Park Place Garage. To get there: Go east on Lane Avenue from 315. NOTE: The bridge on Lane Ave. to cross the Olentangy River (at Olentangy River Rd.) is closed. Hence, you should follow the following route:

Turn right (south) on Fyffe Rd. off Lane Ave.

Turn left (east) on Woody Hayes Dr., turn right on Tuttle Park Place (road next to stadium) and then turn left into Garage D (Tuttle Park Place Garage). You may walk to Dreese Laboratory, which is nearby, just to the southeast of the Tuttle Park Place Garage (see above map).

## Directions to OSU Aeronautical and Astronautical Research Laboratory / Gas Dynamics and Turbulence Laboratory:

Coming from Campus, take SR **315** North, exit at **Bethel Rd.**

Drive *westward* to **Godown Rd.** (about 1 mile).

Turn *right (North)* onto **Godown Rd.**

Drive approximately 0.5 mile, turn *left (West)* onto **West Case Rd.** Drive approximately 1.25 miles.

Just past OSU Airport (Don Scott Field, see below) and the fire department, turn *right* into the Aeronautical and Astronautical Research Laboratory (AARL) parking lot. Park in a visitor parking space. Gas Dynamics and Turbulence Laboratory (GDTL) and GTL are located within AARL. Room 100, the conference room, is located just inside the main entrance to the left.

