

AD61600 Robots, Art and Culture  
Prof. Fabian Winkler  
Spring 2018

## **AD61600 Robots, Art and Culture**

The history of robots has always been closely connected not only to technological but also cultural and social issues. From early Renaissance automatons to contemporary entertainment, industry and military robots, the field of robotics is developing rapidly, and robots gain an important role in everyday life. This course critically investigates the creative and artistic potential of robot technologies (sensors, actuators, microcontrollers, mechanical locomotion) and looks at existing robots as important reflections of our own culture.

*Robots, Art and Culture* is an experimental and interdisciplinary graduate class. It focuses on three areas: 1) technical workshops exploring basic electronics and programming; 2) the presentation and discussion of key texts relevant to robotic art and robot culture and 3) the creation of individual artworks (which can include basic electronic components and inexpensive microcontrollers, robot platform such as the iRobot Create, electronically generated sound, motor control, locomotion strategies and communication between electronic modules).

Course Number: AD61600  
Professor: Fabian Winkler  
Tuesdays, 7:00–9:50pm  
FPRD204  
Course web site:  
[http://web.ics.purdue.edu/~fwinkler/AD61600\\_S18](http://web.ics.purdue.edu/~fwinkler/AD61600_S18)

## **Contact Information**

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Office hours by appointment  
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Telephone: 49-40160 (office)

## Disabilities and Adaptive Programs Statement

Students with disabilities must register with Adaptive Programs in the Office of the Dean of Students before classroom accommodations can be provided. If you are eligible for academic accommodations because you have a documented disability that will impact your work in this class, please schedule an appointment with the instructor as soon as possible to discuss your needs.

## Counseling and Psychological Services Information

Purdue University is committed to advancing the mental health and well-being of its students. If you or someone you know is feeling overwhelmed, depressed, and/or in need of support, services are available. For help, such individuals should contact Counseling and Psychological Services (CAPS) at (765)494-6995 and <http://www.purdue.edu/caps/> during and after hours, on weekends and holidays, or through its counselors physically located in the Purdue University Student Health Center (PUSH) during business hours.

## Emergency Statement

In the event of a major campus emergency, course requirements, deadlines and grading percentages are subject to changes that may be necessitated by a revised semester calendar or other circumstances. Here are ways to get information about changes in *this* course. Course web page ([http://web.ics.purdue.edu/~fwinkler/AD61600\\_S18](http://web.ics.purdue.edu/~fwinkler/AD61600_S18)), my email address: [fwinkler@purdue.edu](mailto:fwinkler@purdue.edu), and my office phone: 494-0160.

- To report an emergency, call 911.
- To obtain updates regarding an ongoing emergency and to sign up for Purdue Alert text messages view [www.purdue.edu/ea](http://www.purdue.edu/ea).

**EMERGENCY NOTIFICATION PROCEDURES are based on a simple concept – if you hear a fire alarm inside, proceed outside. If you hear a siren outside, proceed inside.**

- **Indoor Fire Alarms** mean to stop class or research and immediately **evacuate** the building. Proceed to your Emergency Assembly Area away from building doors. **Remain outside** until police, fire, or other emergency response personnel provide additional guidance or tell you it is safe to leave.
- **All Hazards Outdoor Emergency Warning Sirens** mean to immediately seek shelter (**Shelter in Place**) in a safe location within the closest building. “Shelter in place” means seeking immediate shelter inside a building or University residence.

This course of action may need to be taken during a tornado, an active threat including a shooting or release of hazardous materials in the outside air. Once safely inside, find out more details about the emergency\*. **Remain in place** until police, fire, or other emergency response personnel provide additional guidance or tell you it is safe to leave.

*\*In both cases, you should seek additional clarifying information by all means possible...Purdue Emergency Status page, text message, Twitter, Desktop Alert, Albertus*

*Beacon, digital signs, email alert, TV, radio, etc....review the Purdue Emergency Warning Notification System multi-communication layers at [http://www.purdue.edu/ehps/emergency\\_preparedness/warning-system.html](http://www.purdue.edu/ehps/emergency_preparedness/warning-system.html)*

## EMERGENCY RESPONSE PROCEDURES:

- Review the **Emergency Procedure Guidelines**  
[https://www.purdue.edu/emergency\\_preparedness/flipchart/index.html](https://www.purdue.edu/emergency_preparedness/flipchart/index.html)
- Review the **Building Emergency Plan** (available on the Emergency Preparedness website or from the building deputy) for:
  - evacuation routes, exit points, and emergency assembly area
  - when and how to evacuate the building.
  - shelter in place procedures and locations
  - additional building specific procedures and requirements.

## EMERGENCY PREPAREDNESS AWARENESS VIDEOS

- **"Run. Hide. Fight.®"** is a 6-minute active shooter awareness video that illustrates what to look for and how to prepare and react to this type of incident. See:  
[https://www.youtube.com/watch?v=5mzI\\_5aj4Vs](https://www.youtube.com/watch?v=5mzI_5aj4Vs) (Link is also located on the EP website)

## MORE INFORMATION

Reference the Emergency Preparedness web site for additional information:  
[https://www.purdue.edu/ehps/emergency\\_preparedness/](https://www.purdue.edu/ehps/emergency_preparedness/)

## Course Evaluations Statement

During the last two weeks of the semester, you will be provided with an opportunity to evaluate this course and your instructor(s). Purdue now uses an online course evaluation system. Near the end of classes, you will receive an official e-mail from administrators with a link to the online evaluation suite. You will have up to two weeks to complete this evaluation. Your participation in an integral part to this course and your feedback is vital to improving education at Purdue University. I strongly urge you to participate in the evaluation system.

## Academic Dishonesty Statement

Purdue prohibits "dishonesty in connection with any University activity. Cheating, plagiarism, or knowingly furnishing false information to the University are examples of dishonesty." [Part 5, Section III-B-2-a, of University Regulations] Furthermore the university Senate has stipulated that "the commitment of acts of cheating, lying, and deceit in any of their diverse forms (such as the use of substitutes for taking examinations, the use of illegal cribs., plagiarism, and copying during examinations) is dishonest and must not be tolerated. Moreover, knowingly to aid and abet, directly or indirectly, other parties in committing dishonest acts is in itself dishonest." [University Senate Document 72-18, December 15, 1972]

## **Plagiarism Statement**

The Office of the Dean of Students will investigate instances of reported plagiarism and take appropriate actions. See the Dean of Students web page for descriptions of plagiarism and university plagiarism policies).

<http://www.purdue.edu/univregs/studentconduct/regulations.html>. All acts of plagiarism are violations of the University Academic Dishonesty Policy and will be dealt with according to procedures established by the university.

*As a boilermaker pursuing academic excellence, I pledge to be honest and true in all that I do. Accountable together – we are Purdue.*

## **Class Attendance Statement**

Purdue University policy states that all students are expected to be present for every meeting of classes in which they are enrolled. All matters relative to attendance, including the make-up of missed work, are to be arranged between you and the instructor. Only the instructor can excuse you from classes or course responsibilities. In the case of an illness, accident, or an emergency, you should make direct contact with your instructor as soon as possible, preferably prior to class. If the instructor cannot be reached directly a message should be left in the instructor's departmental mailbox or with the department secretary. If you will be absent for more than five days, and have not been able to reach the instructor in person or by telephone or through leaving notification of your circumstances with the divisional secretary, you or your representative should notify the Dean of Students (765-494-1254) as soon as possible after becoming aware that the absence is necessary. Be advised, you may be asked to provide documentation from an authorized professional or agency which supports an explanation for your absence.

## **Reproduction of Student Work Statement**

The Purdue University Department of Art and Design (School of Visual & Performing Arts) retains a non-exclusive right to reproduce all undergraduate and graduate student projects for the purpose of education, publication, promotion, illustration, advertising, trade in any manner or medium now known or later developed in perpetuity.

## Course Learning Outcomes

After completing this course students will:

- connect technologies to artistic concepts and use the technical skills acquired in this class for the purpose of critical/aesthetic expression or commentary.
- be able to contextualize their work in the history of robots and their impact on culture.
- know key works of artists working with robotic technologies.
- know historical as well contemporary discourses in the field of robotic art.
- have gained technical skills including the use of:
  - the Arduino microcontroller
  - smart LEDs
  - advanced touch sensors
  - the iRobot Create robot development platform

## Grading Guidelines

I will look specifically at the idea behind your assignment work. Every project starts with a good idea or concept. The best ideas are often simple – without being simple-minded! Project work resulting from these ideas needs to be consistent, precise and on the point. Some of the questions I use to evaluate your work are: How original is the idea behind the work? How precise is realization of this idea? Was the student well motivated and was he/she present the idea clearly in class? Not only will I look at your performance presenting your own work during critiques but I will also take into consideration your overall participation in class discussions and critique of other students' work.

You can create outstanding works in this class without the use of overly complex technology but rather with a clever and imaginative use of the resources at hand. Ideally, the projects you are creating in this course place your ideas and concepts in a larger context – it can be related to society, cultural or political issues, historical events, personal experiences, etc.

In summary, the highest grades will be given for work that is highly original, creative and imaginative. This work exemplifies concepts in surprising and challenging ways and adds something to what already exists. An outstanding work needs to possess a strong aesthetic element and create meaning effectively through form, motion and story/expressiveness. It should have the potential to open doors to new ways of thinking about the theme/content it investigates.

Individual assignment breakdown:

▪ 01 Robots and Culture	20%
▪ 02 Touch!	20%
▪ 03 Graduate Project	35%
▪ 04 Reading Presentation	25%

I also require the submission of a **documentation portfolio** (not graded but required for passing the class) at the end of the semester that should be submitted digitally via Purdue's filelocker file sharing service. This portfolio should include one folder per assignment containing:

- a project description (300 words max.) (word, .pdf)
- 3–5 still images of the work (.jpg, .png, or .tif)

- a short video documentation (around 1–2 minutes) of the work (mp4)
- for the assignment 03, the graduate project please also include the project proposal (word, .pdf)
- for assignment 04, the reading presentation you will only need to include a copy of your Powerpoint presentation.

**The deadline for submitting this digital portfolio is Friday, May 4, 2018 at 12pm noon.**

## Required Materials

Every student in this course needs an **Arduino board** (recommended: UNO R3 or similar w/ matching USB cord, see: <https://store.arduino.cc/usa/arduino-uno-rev3>). If you do not already own an Arduino board **please purchase one by Tuesday, January 30** at the latest. In addition to the Arduino board students will need the following supplies (please fill out and return the material order form at the end of this document if you would like to order some or all of these materials).

Description	Price
7812 12VDC voltage regulator <a href="http://www.newark.com/on-semiconductor/mc7812ctg/ldo-voltage-regulator-12v-1a-to/dp/88H4762">http://www.newark.com/on-semiconductor/mc7812ctg/ldo-voltage-regulator-12v-1a-to/dp/88H4762</a>	0.50
Adafruit 12-Key Capacitive Touch Sensor Breakout – MPR121 <a href="https://www.adafruit.com/product/1982">https://www.adafruit.com/product/1982</a>	7.50
Breadboard (recommended – half size from Newark): <a href="https://www.adafruit.com/products/64">https://www.adafruit.com/products/64</a>	2.00
at least 2 alligator clips <a href="https://www.adafruit.com/product/1008">https://www.adafruit.com/product/1008</a>	0.50
NeoPixel (based on WS2812 chip) RGB LED <a href="https://www.adafruit.com/product/1734">https://www.adafruit.com/product/1734</a>	1.00

## Shopping Resources for electronics related supplies:

- on campus: EE Parts Room  
EE Building, dutch door opposite of the main entrance for EE129
- Lafayette Electronics Supply (<http://www.lafayetteelectronic.com>)  
405 N Earl Ave  
Lafayette, IN 47903  
(800) 842-1527
- Radioshack (<http://www.radioshack.com>)  
135 S. Chauncy Ave. Ste. F1  
West Lafayette, IN 47906  
(765) 743-3703  
**Ask for their 10% Purdue discount!**

### Online:

- Adafruit (<https://www.adafruit.com/>)
- Sparkfun Electronics (<http://www.sparkfun.com>)
- MCM Electronics (<http://www.mcmelectronics.com>)
- Newark (<http://www.newark.com>)
- Jameco (<http://www.jameco.com>)
- Digikey (<http://www.digikey.com>)
- Amazon (<http://www.amazon.com>)

## Advanced Manufacturing/Fabrication

Unless students have access to other manufacturing sources on campus all physical construction for the works in this class (if necessary) should be done through the Bechtel Innovation Design Center on campus <https://www.purdue.edu/bidc/>.

In order to access the services of this facility, students need to register online and complete mini online workshops to gain access to the machines and help of the support staff. Please follow the directions at: [https://engineering.purdue.edu/aflapps/AFL\\_projects/registration.php](https://engineering.purdue.edu/aflapps/AFL_projects/registration.php)

## List of Relevant Artists

A highly incomplete list but a good starting point for further research:

- David Bowen  
<http://www.dwbowen.com/>
- Alexander Calder's Circus (1926–31)  
<https://youtu.be/t6jwnu8lzy0>
- Louis-Philippe Demers  
<https://vimeo.com/lpdemers>
- Heather Dewey-Hagborg  
<http://deweyhagborg.com/>
- Ken Goldberg  
<http://goldberg.berkeley.edu/art/index.html>
- Garnet Hertz  
<http://conceptlab.com/>
- Theo Jansen  
<http://www.strandbeest.com/>
- Amy Karle  
<https://www.amykarle.com>
- Ann-Katrin Krenz  
<http://frau-krenz.de/parasitic-symbiotic/>
- Maywa Denki  
[http://www.maywadenki.com/biography/bio\\_en/](http://www.maywadenki.com/biography/bio_en/)
- Chico MacMurtrie  
<http://amorphicrobotworks.org/>
- Eric Paulos  
<http://www.paulos.net/>
- Simon Penny  
<http://simonpenny.net/>
- Sabrina Raaf  
<http://raaf.org/>

#### Relevant Artist List (cont'd):

- Douglas Repetto  
<http://douglasrepetto.com/portfolio/>
- Ken Rinaldo  
<http://www.kenrinaldo.com/>
- Robotlab  
[http://www.robotlab.de/index\\_en.htm](http://www.robotlab.de/index_en.htm)
- Björn Schülke  
<http://www.schuelke.org/>
- Stelarc  
<http://stelarc.org/projects.php>
- Survival Research Labs  
<http://www.srl.org/>
- Symbiotica  
<http://www.symbiotica.uwa.edu.au/>
- Jean Tinguely  
<https://youtu.be/GmrDEX4P5I8>
- Bill Vorn  
<http://billvorn.concordia.ca/menuall.html>
- Norman White  
<http://www.normill.ca/>
- Maria Yablonina  
<https://www.mariayablonina.com/>
- Huang Yi  
<https://www.sozoartists.com/huangyi/>

### Art and Design Mailing List

If you would like to find out about the latest events in the Department of Art and Design, internship opportunities, exhibitions and other art and design related news, please sign up to the moderated mailing list in the Department of Art and Design:

<https://lists.purdue.edu/mailman/listinfo/artanddesign>

Please direct any questions about the A&D mailing list to Kathy Evans: [kathy@purdue.edu](mailto:kathy@purdue.edu)

Also check the bulletin board in the FPRD hallway outside of FPRD204 for call outs, announcements and news clippings.

## Schedule

Week 01	Tuesday, 1/9/2018	Course Introduction. Introduction to course reader and materials. Give out project 01.  Register with Purdue's Bechtel Innovation Design Center: <a href="https://www.purdue.edu/bidc/">https://www.purdue.edu/bidc/</a>
Week 02		<hr/> <b>01 ROBOTS AND CULTURE</b> <hr/>
	Tuesday, 1/16/2018	Student introduction. Finalize Student Reading Presentation schedule. Discuss initial readings and project ideas.
Week 03	Tuesday, 1/23/2018	Work in progress
Week 04	Tuesday, 1/30/2018	Presentation of project 01  In preparation for the next meeting – familiarize yourself with Arduino with <i>Lady Ada's Learn Arduino!</i> <a href="https://learn.adafruit.com/ladyadas-learn-arduino-lesson-number-0">https://learn.adafruit.com/ladyadas-learn-arduino-lesson-number-0</a>
Week 05		<hr/> <b>02 TOUCH!</b> <hr/>
	Tuesday, 2/6/2018	Arduino Workshop 01: LED control
Week 06	Tuesday, 2/13/2018	Arduino Workshop 02: Touch Sensor
Week 07	Tuesday, 2/20/2018	Student Reading Presentations 01: <b>Yilin</b> on Choi, Charles Q. "Not Tonight, Dear, I Have to Reboot." and "Humans Marrying Robots? A Q&A with David Levy." <b>Janna</b> on Richardson, Kathleen. "The Asymmetrical 'Relationship': Parallels Between Prostitution and the Development of Sex Robots." <b>Di</b> on Mar, Alex. "Love in the Time of Robots."

Week 08  
Week 09  
Week 10  
Week 11  
Week 12  
Week 13  
Week 14  
Week 15  
Week 16

Tuesday,  
2/27/2018

Work in progress

Tuesday,  
3/6/2018

Critique of project 02: Touch!

Tuesday,  
3/13/2018

No classes. Spring Vacation

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**03 GRADUATE PROJECT**

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Tuesday,  
3/20/2018

Student Reading Presentations 02: **Daniel** on Wood, Gaby *Living Dolls*: "Introduction/The Blood of an Android." **Shane** on Dickel, Sascha. "Higher Faster Further." **SJ** on Gips, James. "Toward the Ethical Robot".

Tuesday,  
3/27/2018

Class presentations on proposals for project 03: Graduate Project

Tuesday,  
4/3/2018

iRobot Create workshop

Tuesday,  
4/10/2018

Work in progress

Tuesday,  
4/17/2018

Work in progress

Tuesday,  
4/24/2018

Presentation/Exhibition of Graduate Project

**Finals Week**

Tuesday,  
5/1/2018

No classes. Finals Week

Friday,  
5/4/2018

12pm (noon): deadline to turn in your documentation portfolio digitally via Purdue's filelocker system.

**This syllabus is subject to change - updates will be immediately available on the class website at: [http://web.ics.purdue.edu/~fwinkler/AD61600\\_S18](http://web.ics.purdue.edu/~fwinkler/AD61600_S18).**