

Homework 3 for Undergraduate Students:

[See next page for HW 3 for Graduate Students]

Influential Robotics Papers

Due at class time (11:10AM) on Tuesday, Sept. 16, 2014

1. In this assignment, you will read an influential paper in robotics and write a 1 page summary of the paper.
 - a) Read your individually assigned paper (see attachment). The papers are available on the course website (under Homework 3).
 - b) Prepare a write-up (1-page, single-spaced, 11 point font, 1" margins) of your assigned paper (with your name clearly provided on the writeup). Your write-up should include the following information:
 - Citation information for the paper you are reviewing (i.e., title, authors, where paper appeared, year)
 - Discussion of the following points, including a subsection title for each of the following 7 sections and a short paragraph of complete sentences that addresses each subsection topic:
 - 1) The main point of the paper
 - 2) Why this "main point" is interesting and/or challenging
 - 3) What the particular challenges are that make the paper's topic a difficult problem
 - 4) What techniques have been previously used (i.e., a very brief idea of the related past work)
 - 5) The general approach taken, with some technical details
 - 6) The main results of the paper
 - 7) The main "take-home" message of the paper
 - c) ***Submit your writeup to Blackboard by 11:10AM on Tuesday, Sept. 16.*** Your write-up should be in pdf format. *One component of your grade will be your attention to grammar and spelling. You will lose points if you make grammar or spelling errors.*
2. During the graduate student presentations of the papers on Sept. 16 and 18, complete the distributed evaluation forms (to evaluate your fellow students' presentations), and turn in to the GTA at the end of class. *These evaluation forms will be graded, and will count as quiz grades!* You should give helpful feedback to your fellow students regarding their presentation. This feedback will be shared with them (but anonymized).

Homework 3 for Graduate Students: *Influential Robotics Papers*

Due date/time:

- #1 – Presentation materials: Due at class time (11:10AM) on Tuesday, Sept. 16**
#2 – Oral presentation: Tuesday, Sept. 16 or Thursday, Sept. 18 (per attached schedule)
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1. In this assignment, you will read an influential paper in robotics and present it to the class (in a 6 minute presentation) next week.
 - a) Read your assigned paper (see attachment); this paper assignment is different for each grad student. The papers are available on the course website (under Homework 3).
 - b) Prepare an oral presentation of your assigned paper. Your presentation will be on either Tuesday, Sept. 16, or Thursday, Sept. 18, according to the attached presentation order. You must bring your own laptop to give your presentation, or borrow someone else's (but make arrangements in advance). Your "due date/time" for giving the presentation is the day listed, and in the order listed, in the attachment.

Your presentation should be 6 minutes (no longer, or you'll get cut off), and should include the following information:

- Your name
 - Citation information on the paper you are presenting (i.e., title, authors, where paper appeared, year)
 - Discussion of the following:
 - The main point of the paper
 - Why this "main point" is interesting and/or challenging
 - What the particular challenges are that make the paper's topic a difficult problem
 - What techniques have been previously used (i.e., a very brief idea of the related past work)
 - The general approach taken, with some technical details
 - The main results of the paper
 - The main "take-home" message of the paper
 - In your presentation, you should include images that are relevant to the paper; you may also show a *very brief* (no longer than 30 seconds) related video, if it was prepared by the authors of the paper you are presenting.
 - Your presentation will be followed by 1 minute of Q&A with the class. (Please ask your fellow students questions after their presentations!)
- c) **Submit your presentation to Blackboard by 11:10AM on Tuesday, Sept. 16.** Your presentation should be in either pdf format, or in PowerPoint format.
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2. During the presentations on Sept. 16 and 18, complete the distributed evaluation forms (to evaluate your fellow students' presentations), and turn in to the GTA at the end of class. *These evaluation forms will be graded, and will count as quiz grades!* You should give helpful feedback to your fellow students regarding their presentation. This feedback will be shared with them (but anonymized).

Undergraduate Student Paper Assignments

Assigned Paper #	Name	Name
1	Brethen, Brandon	Masters, Drew
2	Brukiewa, Patrick	Messing, Andrew
3	Butler, Reese	Murray, John
4	Clark, Mark	Ranjan, Niloo
5	Combs, David	Reynolds, John
6	Deuso, Kelley	Richmond, Stephen
7	Enix, Jackson (Stoney)	Seagraves, Kayleigh
8	Finney, Jamie	Sherman, Isaac
9	Freels, David	Simpson, Gregory (Greg)
10	Garbulet, Vasile (Theodor)	Sudbury, Nicholas (Nick)
11	Glover, Randall (Nash)	Zhang, Cheng
12	Hewitt, John	
13	Hollomon, Aaron	
14	Ingman, Victoria	
15	Jackson, Jonathan	
16	Jeffords, Richard	
17	LaClair, Adam	
18	Li, Xiaoyi (Nina)	

Graduate Student Paper Assignments

Assigned paper #	Name	Presentation Day
1	Alkhuwaiter, Ammar	Tues., 9/16
2	Almami, Abdulqader	Tues., 9/16
3	Cox, Shawn	Tues., 9/16
4	Dorris, Joseph (Joe)	Tues., 9/16
5	Fagan, Josh	Tues., 9/16
6	Ferguson, James (Jake)	Tues., 9/16
7	Graves, Russell	Tues., 9/16
8	Hawkersmith, Tate	Tues., 9/16
9	LaBorde, Chris	Tues., 9/16
10	Malone, Timothy (Bo)	Thurs., 9/18
11	McBride, Allen	Thurs., 9/18
12	Miller, Casey	Thurs., 9/18
13	Nash, Andrew (Drew)	Thurs., 9/18
14	Raetano, Joseph	Thurs., 9/18
15	Srinivasan, Aravind	Thurs., 9/18
16	Talley, Aliceann	Thurs., 9/18
17	Zhang, Yang	Thurs., 9/18
18	Zhong, Shiqi (Qi)	Thurs., 9/18

Paper List (see course website, under Homework 3, for links to papers)

- 1) **"Pengi: An Implementation of a Theory of Activity"**,
Philip E. Agre and David Chapman,
Sixth National Conference on Artificial Intelligence (AAAI-87), 1987
- 2) **"Reactive Reasoning and Planning"**,
Amy Lansky and Michael P. Georgeff,
Sixth National Conference on Artificial Intelligence (AAAI-87), 1987
- 3) **"A Robust, Qualitative Method for Robot Spatial Learning"**,
Benjamin J. Kuipers and Yung-Tai Byun,
Seventh National Conference on Artificial Intelligence (AAAI-88), 1988
- 4) **"Learning to Coordinate Behaviors"**,
Pattie Maes and Rodney A. Brooks ,
Eighth National Conference on Artificial Intelligence (AAAI-90), 1990
- 5) **"Elephants don't play chess"**,
Rod Brooks,
Robotics and Autonomous Systems, vol. 6, no. 1-2, pp. 3-15, 1990
- 6) **"Estimating the Absolute Position of a Mobile Robot Using Position Probability Grids"**,
Wolfram Burgard, Dieter Fox, Daniel Hennig, and Timo Schmidt
Thirteenth National Conference on Artificial Intelligence (AAAI-96), 1996
- 7) **"Auction-Based Multi-Robot Routing"**,
M. G. Lagoudakis, et al.
Robotics Science and Systems, 2005
- 8) **"Distributed Coverage Control with Sensory Feedback for Networked Robots"**,
M. Schwager, J. McLurkin, D. Rus,
Robotics Science and Systems, 2006
- 9) **"Safety Evaluation of Physical Human-Robot Interaction via Crash-Testing"**,
Sami Haddadin, Alin Albu-Schffer, Gerd Hirzinger,
Robotics Science and Systems, 2007
- 10) **"Cooperative manipulation and transportation with aerial robots"**,
N. Michael, J. Fink, V. Kumar,
Robotics Science and Systems, 2009
- 11) **"CHOMP: Gradient Optimization Techniques for Efficient Motion Planning"**,
Nathan Ratliff, Matthew Zucker, James Bagnell, Siddhartha Srinivasa,
International Conference on Robotics and Automation, 2009

- 12) **"Learning and Generalization of Motor Skills by Learning from Demonstration"**,
Peter Pastor, Heiko Hoffmann, Tamim Asfour, Stefan Schaal,
International Conference on Robotics and Automation, 2009
- 13) **"Fast 3D Recognition and Pose Using the Viewpoint Feature Histogram"**,
Radu Bogdan Rusu, Gary Bradski, Thibaux Romain, John Hsu,
International Conference on Intelligent Robots and Systems, 2010
- 14) **"Efficient Sparse Pose Adjustment for 2D Mapping"**,
K. Konolige, G. Grisetti, B. Limketkai, W. Burgard, R. Kuemmerle, Regis Vincent,
International Conference on Intelligent Robots and Systems, IROS 2010
- 15) **"Autonomous Multi-Floor Indoor Navigation with a Computationally Constrained MAV"**
Shaojie Shen, Nathan Michael, Vijay Kumar,
International Conference on Robotics and Automation, 2011
- 16) **"TERMES: An Autonomous Robotic System for Three-Dimensional Collective Construction"**,
Kirstin Petersen, Radhika Nagpal, Justin Werfel,
Robotics Science and Systems, 2011
- 17) **"Kilobot: A Low Cost Scalable Robot System for Collective Behaviors"**,
Michael Rubenstein, Christian Ahler, Radhika Nagpal,
International Conference on Robotics and Automation, 2012
- 18) **"A Benchmark for the Evaluation of RGB-D SLAM Systems"**,
Jrgen Sturm, Nikolas Engelhard, Felix Endres, Wolfram Burgard, Daniel Cremers,
International Conference on Intelligent Robots and Systems, 2012