Master of Science in Engineering in Robotics

Graduate Student Advising Manual

2015-2016
Welcome!

Welcome to the Laboratory for Computational Sensing and Robotics (LCSR)! This manual is designed to serve as a guide for graduate students in LCSR to work more effectively and to describe the basic academic requirements for the MSE in Robotics degree. The detailed planning of an academic program, such as choosing courses and the like must be done with the guidance of the faculty advisor.

This manual covers policies, rules, and procedures, and offers suggestions regarding our program. Please address issues and questions not covered by this manual to your faculty advisor and/or Academic Program Administrator Alison Morrow. Please note that this document is not phrased to professional legal standards and that you will want to clarify any unclear issues with the department.

1. Robotics MSE Degree

The full-time Master of Science in Engineering in Robotics (MSE) degree requirements, along with general information will be described here.

1.1. Residency Requirements

Once students begin their graduate course of study toward a degree, they must complete a minimum of two consecutive semesters of registration as a full-time, resident graduate student. To qualify as a resident student, the student must be present on campus and working toward fulfilling the requirements for the degree. Complete information is available on the JHU Graduate Board’s website at homewoodgrad.jhu.edu.

1.2. English Language Assessments for International Students

The English Language Program for International Teaching Assistants of the Language Teaching Center offers courses designed to make your teaching assistant as effective and enjoyable as possible. Placement testing is required for all new international graduate students, and will be conducted in the beginning of the Fall semester. The testing and courses that are recommended will improve English language skills, teach American classroom culture, and offer pointers in teaching techniques.

International graduate students cannot serve as a Teaching Assistant until the assessment is taken and all recommended remedial courses are successfully completed.

1.3. “Responsible Conduct of Research” Course

- Responsible Conduct of Research training course, (online); AS.360.625 Online tutorial required for all incoming M.S.E. students.
• **Responsible Conduct of Research (in-person):** may be required for certain research projects. More information: [http://eng.jhu.edu/wse/page/conduct-of-research-training](http://eng.jhu.edu/wse/page/conduct-of-research-training).

### 1.4. Advisors

**MSE Academic Advising**

All incoming MSE students will be assigned an MSE Academic Advisor.

**MSE Essay Advising**

Many students elect to take the Course Option. In some cases, with the approval of a research advisor, the Essay Option may be used to fulfill the MSE Robotics degree requirements. In the standard Course Option, ten (10) courses must be taken as articulated herein. For the Essay Option, eight (8) courses must be taken, and research must be performed leading to a formal MSE Essay. Degree Track requirements (see below) are the same for both the Course and Essay Options.

*Primary Robotics MSE Essay Advisor Requirements:* Primary advisors for all Robotics MSE Theses must be approved in advance by the Robotics MSE Curriculum Committee.

*School of Engineering MSE Essay Advisor Requirement:* To partially fulfill the degree requirement, the Essay must be approved and signed by the primary advisor. If the primary advisor is not a robotics faculty member holding primary appointment in the Whiting School of Engineering, a second advisor (who satisfies this requirement) must also read and sign the essay.

### 1.5. MSE Degree Requirements

- Course Requirements:
  - Course-Option: 10 full-time academic courses (e.g. not seminars, safety training, etc.).
  - Essay-Option: 8 full-time academic courses (e.g. not seminars, safety training, etc.) and a Master’s Essay supervised by a WSE faculty member who has been approved by the Robotics MSE Curriculum Committee to serve as a faculty advisor.

  - To qualify for the essay option, fill out and submit and essay application form at least two weeks before the beginning of your research.
- Your essay must be submitted to your advisor for edits at least four weeks before the Robotics essay submission deadline (for more details: http://lcsr.jhu.edu/robotics-mse-academic-resources/)

At least 6 of these courses must be at the graduate level as defined by the offering department/center. All courses counted toward the MSE degree requirements must be at the 300 level or above. Non-credit courses such as the weekly seminar courses offered by LCSR and Departments may not count toward this course requirement.

- Foundation Course Requirements: Two core courses, weekly seminar course, and systems/implementation requirement.

- Track Course Requirement: Four courses fulfilling one of the following track requirements:
  - Track in Medical Robotics and Computer Integrated Surgical Systems
  - Track in Perception and Cognitive Systems
  - Track in Automation Science and Engineering
  - Track in Control and Dynamical Systems

  Courses counted towards the track requirement may not be used to satisfy the elective requirement.

- Elective Course Requirement: Four courses, or two courses and a MSE Essay, fulfilling the elective requirement as described in Section 2.7. Courses may be any engineering or quantitative (designated E or Q in the course catalog) course, subject to the degree requirement limitations, as approved by the student’s MSE academic advisor. Courses counted towards the elective requirement may not be used to satisfy the track requirements.

- Academic Ethics (EN.500.603): online tutorial required for all incoming MSE students.

- Research Laboratory Safety (EN.500.401): required for all incoming MSE students.

- Responsible Conduct of Research training course, AS.360.624 (online) required for all incoming MSE students; AS.360.625 (in-person) may be required for certain research projects. More information: (http://eng.jhu.edu/wse/page/conduct-of-research-training).

- Graduate Research Courses: No more than one 1-semester graduate research course (e.g. 530.600) may be counted toward degree requirements.
• WSE Engineering for Professionals (EP) Courses may count toward the MSE degree elective requirements if they are approved in writing by the student’s faculty advisor.

• **Transfer Courses:** Standard WSE policy and limitations on M.S.E. transfer credits apply ([http://eng.jhu.edu/graduate-studies/academic-policies-procedures-graduate/](http://eng.jhu.edu/graduate-studies/academic-policies-procedures-graduate/)). In addition, use of each transfer course toward satisfaction of a specific Robotics M.S.E. degree requirement must be approved in writing by both the student’s faculty advisor and the Robotics M.S.E. Curriculum Committee.

• **Double Counting:** Standard WSE policy and limitations on double counting apply ([http://eng.jhu.edu/wse/page/graduate-double-counting](http://eng.jhu.edu/wse/page/graduate-double-counting)).

• **Duration:** Students must complete degree within 5 years from matriculation in the M.S.E. program. University-approved leave of absence does not count toward this limit

• **Residency Requirement:** Minimum residency of two full-time academic terms at WSE.

### 1.6. MSE Core Courses

Two first year graduate level courses form the core of the Robotics MSE program. Although these courses can be taken in either order, it is expected that 600.636 will usually be taken first, followed by 530.646.

#### 600.636 Algorithms for Sensor-Based Robotics

**Prerequisites:**

• Data Structures; C++ programming; calculus; linear algebra; basic probability and statistics

**Content:**

• Robot arms and mobile robots

  **Sensors**  
  • Basics of geometric modeling & sensing of environment and task space
  • Configuration Space
  • Uncertainty characterization
  • Motion planning
  • Sensor fusion
  • Simultaneous localization and mapping (SLAM)

#### 530.646 Robot Devices, Kinematics, Dynamics, and Control

**Prerequisites:**

• Multivariable integral and differential calculus (110.108, 110.109, 110.202)
• Classical physics (171.101, 171.102)
• Linear algebra (550.191 or 110.201)
• Ordinary differential equations (550.291 or 110.302)
• Programming: Knowledge of the Matlab programming language including data input/output, 1-D and 2-D arrays, and user-defined function calls. Students with experience with these language elements in other programming languages (C, C++, Python, Java, etc.) should be able to self-tutor themselves in the Matlab language as part of the programming exercises.

Content: Graduate-level introduction to the mechanics of robotic systems with emphasis on the mathematical tools for kinematics and dynamics of robot arms and mobile robots. Topics include the geometry and mathematical representation of rigid body motion, forward and inverse kinematics of articulated mechanical arms, trajectory generation, manipulator dynamics, actuation, design issues, manipulator control, and additional special topics.

Seminar Course Requirement
Students are required to register for the following non-credit weekly robotics research seminar course every term in which they are in full-time residency:
500.745 Seminar in Computational Sensing and Robotics

Systems/Implementation Requirement
• Students must demonstrate the ability to undertake substantial implementation projects requiring independent design and decision making.
• Students will be required to take one course with a project involving substantial interaction with or development of actual hardware (sensors, mechanisms, etc) and one course requiring a substantial software implementation effort.
• Course projects may have both elements but two courses are still required and the student’s individual focus in group projects must have one in each area.
• A student’s MSE Essay can, if approved by their advisor, count toward one of the two required systems/implementation project courses.
• Courses that include class projects that are often well suited to satisfying these system/implementation requirement include:
  530.421 Mechatronics
  600.446 Computer-Integrated Surgery II
  600.461/580.481 Computer Vision
The approval of course projects to satisfy the systems/implementation course requirements must be approved by the student’s faculty advisor. The course names, project names, and project dates must be identified in the Robotics MSE Checkout Sheet.

1.7. MSE Degree Track Requirements (4 Courses)

Tracks consist of course sequences that provide the student with strength in a specific area. The required and recommended courses for tracks are listed below. Other courses may be substituted only with written approval of both the student’s academic advisor and the Robotics MSE curriculum committee. Many of these courses are offered in multiple departments – alternative course numbers for the same class are acceptable substitutions. Please confirm with your advisor that you have signed up for the correct courses.

**Track in Medical Robotics and Computer Integrated Surgical Systems**

Required for the track:

- 600.645 Computer-Integrated Surgery I
- 600.646 Computer-Integrated Surgery II

Two of the following:
- 520.433 Medical Image Analysis
- 500.410 Surgery for Engineers
- 600.461/580.481 Computer Vision
- 600.684 Medical Augmented Reality
- 520.432/580.472 Medical Imaging Systems

**Track in Perception and Cognitive Systems**

Required for the track:

- 600.461 Computer Vision
- 600.435 Artificial Intelligence

Two of the following Courses:

- 530.420 Robot Actuators and Sensors
- 530.421 Mechatronics
- 530.660 Computational Analysis of Stochastic Processes
530.649 Adaptive Systems and System Identification
530.676 Locomotion in Mechanical and Biological Systems
530.647 Adaptive Systems
600.660 FFT in Graphics and Vision
600.475 Introduction to Machine Learning
600.735 Seminar in Machine Learning
580.628 Topics in Systems Neuroscience

**Track in Automation Science and Engineering**

Required for the track

530.414 Computer-Aided Design
530.354 Manufacturing Engineering

Two of the following Courses:

550.457 Topics in Operations Research
550.661 Foundations of Optimization
550.662 Optimization Algorithms
530.420 Robot Sensors/Actuators
530.660 Computational Analysis of Stochastic Processes
530.649 Adaptive Systems and System Identification
530.421 Mechatronics
600.461 Computer Vision
530.495 Microfabrication Laboratory
530.653 Advanced Systems Modeling
530.648 Group Theory in Engineering Design

**Track in Control and Dynamical Systems**

Required for the track

530.616 Introduction to Linear Systems (cross-listed courses: 530.616 Introduction to Linear Systems, 520.601 Introduction to Linear Systems Theory, 580.616 Introduction to Linear Dynamical Systems)
530.678 Nonlinear Control and Planning in Robotics

Two of the following Courses:

520.621 Intro to Nonlinear Systems
530.603 Applied Optimal Control
530.647 Adaptive Systems
530.648 Group Theory in Engineering Design
530.649 System Identification
530.653 Advanced Systems Modeling
530.654 Advanced Systems Modeling II
530.660 Computational Analysis of Stochastic Processes
530.676 Locomotion in Mechanical and Biological Systems
520.618 Hybrid Systems
520.633 Introduction to Robust Control
550.662 Optimization Algorithms
550.692 Matrix Analysis
530.624 Dynamics of Robots and Spacecrafts
550.697 Intro to Control Theory and Optimal Control

1.8. MSE Degree Electives Courses (4 Courses or 2 Courses + MSE Essay)

Any engineering or quantitative (designated E or Q in the course catalog) course, subject to the degree requirement limitations, as approved by the student’s MSE academic advisor. Included, but not limited are the following:

520.432 Medical Imaging Systems
520.427 Product Design Laboratory
520.433 Medical Image Analysis
520.483 Bio-Photonics Laboratory
520.491 CAD Design of Digital VLSI Systems I
530.414 Computer-Aided Design
530.420 Robot Sensors and Actuators
530.421 Mechatronics
530.424 Dynamics of Robots and Spacecraft
530.354 Manufacturing Engineering
530.495 Microfabrication Laboratory
530.616 Introduction to Linear Systems
530.628 Nonlinear Dynamical Systems
530.647 Adaptive Systems
530.649 System Identification
530.653 Advanced Systems Modeling
530.660 Computational Analysis of Stochastic Processes
530.676 Locomotion in Mechanical and Biological Systems
530.678 Nonlinear Control and Planning in Robotics
530.707 Robot Systems Programming
550.457 Topics in Operations Research
550.661 Foundations of Optimization
550.662 Optimization Algorithms
580.628 Topics in Systems Neuroscience
600.435 Artificial Intelligence
600.445-6 Computer Integrated Surgery I & II
600.461 Computer Vision
600.475 Introduction to Machine Learning
600.646 Advanced Computer-Integrated Surgery II
600.660 FFT in Graphics and Vision
600.735 Seminar in Machine Learning

1.9. Academic Performance Requirements

Course Grade Requirement: A course is satisfactorily completed if a grade from A+ to C‐ is obtained. No more than one C+, C, or C‐ can be counted toward the degree requirements. A grade of D or F or second C+, C, or C‐ grade results in probation. A second D or F, or a third C+, C, or C‐ grade is grounds for termination from the program.

1.10. Academic Deadlines

Students preparing to complete a degree program in a given semester should see Alison Morrow to ensure that all necessary forms and requirements have been completed and submitted prior to the academic deadlines for the semester. The deadlines to submit all certification material are usually as follows:

- Fall: late-October
- Winter: mid- to late-January
- Spring: early-May
- Summer: late-July

Students who have not completed their requirements by the first day of classes must register for the current semester.

Those who have completed their requirements in the summer or fall will receive an interim certificate from the registrar’s office indicating that all requirements have been met, and notation will be made on their transcript. Diplomas are awarded once a year,
2. Miscellaneous Academic Information

2.1. Graduate Student Annual Reviews

A written review of all master’s students is required. The review process includes the opportunity for a student to offer a self-evaluation to discuss with his or her advisor.

The Graduate Program Committee has created a review form, which is in the back of this manual.

Before the first day of class in the Spring semester, usually the fourth Monday in January, all master’s students must complete this form and discuss it with their advisor. The student and advisor will both sign the review, which will be given to our Academic Program Administrator, Alison Morrow for filing.

The greatest benefit of this review will no doubt come from the student-advisor meetings, but the completed reviews are also structured to provide the center with a meaningful measure of the progress that our students are making.

2.2. Essay Option

- Many students elect to take the Course Option. In some cases, with the approval of a research advisor, the Essay Option may be used to fulfill the MSE Robotics degree requirements. In the Course Option, ten (10) courses must be taken as articulated above. For the Essay Option, eight (8) courses must be taken, and research must be performed leading to a formal MSE Essay. Degree Track requirements are the same for both the Course and Essay Options.

- To qualify for the essay option, fill out and submit an essay application form at least two weeks before the beginning of your research.

- It is recommended that students meet with their essay advisors to develop a timeline for research and essay writing, and that portions of the essay be written as the research proceeds. For example, the introduction, background, and motivation for the research can and should often be written in the very early stages of the research. It is highly recommended that the student and advisor choose a second reader to review the essay. At least one reader must be a primary faculty in LCSR, and have their primary appointment in the Whiting School, or be approved by the Robotics Curriculum Committee.

- Your essay must be submitted to your advisor for edits at least four weeks before the Robotics essay submission deadline.
• The final version of the master’s essay must be submitted, with the cover page signed by the student’s advisor, to the LCSR Administrative Office and EDT (Electronic Theses and Dissertation staff) by the essay completion date. See Alison Morrow for updated deadline information.

2.3. LCSR Seminars

Part of the graduate experience is to become informed about and learn to evaluate the research done by others, both here at Johns Hopkins and at leading institutions worldwide.

SEMINAR REGISTRATION IS REQUIRED EVERY SEMESTER for M.S.E. STUDENTS!

All Robotics graduate students must register for the non-credit weekly robotics seminar using course number 500.745 each semester.

2.4. Ethics

Unethical behavior can lead to a student’s expulsion from the program. Graduate students are therefore expected to be aware of what actions constitute unethical behavior. For example, students must submit work that represents their own efforts. Whenever ideas or results are drawn from other sources, those sources must be cited in the submitted or presented work. Unless otherwise explicitly permitted by the instructor for that course, students must not collaborate or discuss any assignments prior to submission of the work. Students must be aware of and adhere to the ethical issues associated with the use of, and in particular the duplication of computer software and must abide by the rules of use set by the developer.

Please consider the following, which had previously been published on the Whiting School of Engineering Academic Affairs website: “An ethical campus fosters a positive sense of community and trust, while unethical actions and attitudes breed suspicion, cynicism, and negativity. Johns Hopkins University strives to be a community in which honesty and respect are valued and upheld, and in which all members of the community uphold the highest degree of ethical conduct.

“Academic ethics is the responsibility of every student, faculty member, and staff person at Johns Hopkins University. You must take the time to learn about what is ethical and what is not - ignorance of ethical rules is not an excuse for cheating. If you see a violation take place, it is your responsibility to report it.

“Every class you take at Hopkins should address ethics, and some activities that are allowed in one class may not be allowed in another class. If you are not sure if an action is ethical for a particular class, e.g. working in a group on homework, read the syllabus carefully and ask your professor.”
Examples of Academic Misconduct:

- Cheating
- Plagiarism
- Reusing Assignments
- Improper Use of the Internet
- Improper Use of Electronic Devices
- Unauthorized Collaboration
- Alteration of Graded Assignments
- Forgery and Falsification
- Lying
- Facilitating Academic Dishonesty
- Unfair Competition

Information about academic policies of the Whiting School of Engineering can be found at http://engineering.jhu.edu/graduate-studies/academic-policies-procedures-graduate/. Please read them.

2.4.1. Transfer Courses

Transfer Courses: Standard WSE policy and limitations on MSE transfer credits apply (http://eng.jhu.edu/wse/page/masters-transfer). In addition, use of each transfer course toward satisfaction of a specific Robotics MSE degree requirement must be approved in writing by both the student’s faculty advisor and the Robotics MSE Curriculum Committee.

2.4.2. Double-Counting Courses

LCSR double-counts courses, using Whiting School of Engineering policy. See http://engineering.jhu.edu/graduate-studies/academic-policies-procedures-graduate/ for information.

Coursework applied to a bachelor's degree:

Students either in a WSE concurrent (bachelor's/master's) program or seeking a WSE master's degree after having earned a WSE or Krieger School of Arts and Sciences bachelor's degree may double-count two courses (400-level or higher) to both programs with the permission of the master's faculty advisor. WSE master's degree candidates may not double-count courses applied to a bachelor's degree earned at a different institution. Individual graduate programs reserve the right to enforce stricter policies.

Coursework not applied to a bachelor's degree:

For students who are either in a WSE concurrent bachelor's/master's degree program or have already earned a Whiting School of Engineering or Krieger School of Arts and Sciences bachelor's degree and are seeking a WSE master's degree, any graduate-level coursework (as defined by the WSE graduate program) not applied to the undergraduate degree may be applied to the graduate degree, regardless of when that course was taken (i.e., before or after the undergraduate degree has been conferred) with the permission of the master's faculty advisor.
2.4.3. Degree Deadlines
The master’s degree completion schedule and deadlines are available at http://engineering.jhu.edu/graduate-studies/academic-policies-procedures-graduate/. Be sure to meet the deadlines when completing your degree and related applications to graduate.

2.4.4. Degree Completion Time Limit
The Whiting School of Engineering states that every student must earn the master’s degree within five consecutive academic years (10 semesters). Only semesters during which a student has a university-approved leave of absence are exempt from the ten semester limit; otherwise, all semesters from the beginning of the student's graduate studies – whether the student is a resident or not – count toward the ten semester limit.

3. Financial Aid
The Office of Student Financial Services has other financial aid sources available, including research assistantships and some fellowships. Any enrolled or accepted graduate student who is a U.S. citizen, U.S. permanent resident, or eligible non-citizen may apply for federal and state financial aid. Sources of aid, eligibility requirements, applications, and other information are available at http://www.jhu.edu/finaid/grads.html.

3.1. Student Employment
The Student Employment Services office offers opportunities for employment for many positions on the campus. They will help you determine your work eligibility. Should you wish to obtain additional employment, please speak with your advisor so you will be able to fulfill the obligations of your education. The Student Employment Services office is located in the basement of Garland Hall, and their website is located at http://www.jhu.edu/stujob/.

4. Laboratory Safety
Lab Safety is the responsibility of all who use, maintain, or visit the labs within the LCSR department. Laboratory researchers are responsible for working with the principal investigator to become familiar with the appropriate hazard information and safety policies before performing any work.

The JHU Department of Health, Safety and Environment maintains a website to ensure updated information on policies, issues, and concerns are available to all. Visit http://www.hopkinsmedicine.org/hse to view directives concerning Safety Responsibilities and Policies, Environmental Monitoring, Fire Safety, Chemical Safety, Laboratory Safety, and Radiation Safety. Please also visit the Whiting School’s Lab Safety page at homewoodgrad.jhu.edu for important information.
For each lab, a Principal Investigator (PI) is assigned. That person is responsible for the safe operation of the lab, training on all chemicals in the work area, the training of the persons on the equipment within the lab, and is a ready source to answer any questions on a specific lab with regards to its operation and all safety aspects. The PIs for each lab are listed on the entrance door to each lab.

5. Security

While the Hopkins Security Department provides ample and appropriate security to the campus, they remind us that we must play our part. Please exercise common sense when entering and leaving your office, classrooms, and labs.

- Secure your computers, especially laptops!
- Back up your work onto separate disks or systems in case something happens to computer via virus, equipment problems, or theft. The University provides free anti-virus software that can be downloaded from the website at http://it.jhu.edu/alerts/.
- Secure your laptop cases or any bag that might be mistaken for a computer bag.
- Lock your car and don’t leave any items inside your car in plain sight. Secure them in your trunk or bring them with you.
- Secure your personal items such as your purse, wallet, books, equipment, and your coat or jacket.
- If you see someone suspicious in your lab or office, don’t confront the individual; contact Security at 410-516-7777 right away. Your personal safety is most important.
- If you are uncomfortable walking through campus or to your car at night or otherwise are concerned for your safety, the Security department provides escort services to selected locations. Call 410-516-8700 to arrange for an escort.

6. Facilities

6.1. Libraries

The Milton S. Eisenhower Library makes available a number of carrels, or desks with lockers each year. The assignment of carrels is made in early fall. Graduate students interested in a carrel locker should notify the Academic Program Administrator.

6.2. Computer Facilities

There are a cornucopia of computing facilities and services available to the Johns Hopkins community. The Information Technology website at http://it.jhu.edu offers an overview of the IT Organization, its projects and services, support for applications and general questions, and news about emerging technologies and strategic imperatives, as well as e-mail, web, and file sharing services.
6.2.1. Information Technology

The Information Technology Department at Johns Hopkins, whose web site is located at http://it.jhu.edu is the online resource for all IT-related information. Their primary focus is to support the missions of the Johns Hopkins Institutions and provide technology solutions for faculty, staff, patients, and students in support of teaching, research, and patient care.

This Web site serves as a repository for all IT-related information at Johns Hopkins. You will find a lot of useful information within this site, including an overview of the IT Organization, its projects and services, support for applications and general questions, and news about emerging technologies and strategic imperatives.

6.2.2. Academic Computer Lab – Krieger Hall

The Academic Computer lab, which offers a wide variety of Mac and Windows operating systems loaded with all kinds of software: Matlab, Mathematica, Microsoft Office, Adobe products and more are available in 160 Krieger Hall. Information is available at http://web1.johnshopkins.edu/classrooms/kriegerlab/.

7. Student Disability Services

The Office of Student Disability Services (SDS) assists full-time undergraduate and graduate students in the Krieger School of Arts and Sciences and the Whiting School of Engineering with disability concerns, in compliance with the provisions of the Americans with Disabilities Act of 1990 (ADA) and Section 504 of the Rehabilitation Act of 1973. SDS assists the University community in understanding the effects of disabilities and in eliminating the physical, technical, attitudinal and programmatic barriers that limit the range of opportunities for students with disabilities, as well as provides individuals with reasonable accommodations. The SDS maintains and protects the confidentiality of individual records as required by law.

For additional information and to access the services of the SDS office, please visit http://web.jhu.edu/disabilities/index.html, contact them at 410-516-4720 or studentdisabilityservices@jhu.edu, or visit their office in 385 Garland Hall.

8. Groups and Activities

8.1. Women of Whiting

This organization serves to foster a sense of community and an environment of support among the graduate student women in the Whiting School. Monthly activities include luncheons with local female faculty and researchers and relaxed social events.
8.2. Extracurricular Activities

Many groups and organizations throughout the University provide ample opportunities for social times and fun. Check out these websites for information:

- Campus Life - http://webapps.jhu.edu/jhuniverse/campus_life/
- Arts and Culture - http://webapps.jhu.edu/jhuniverse/Arts_&_Culture/
- Baltimore Area Convention and Visitors Association - http://baltimore.org/
- Baltimore Office of Promotion and the Arts - http://www.bop.org/

9. Notice of Non-Discriminatory Policy

The Johns Hopkins University admits students of any race, color, sex, religion, national or ethnic origin, handicap or veteran status to all of the rights, privileges, programs, benefits and activities generally accorded or made available to students at the University. It does not discriminate on the basis of race, color, sex, religion, sexual orientation, national or ethnic origin, handicap or veteran status in any program or activity, including the administration of its educational policies, admission policies, scholarship and loan programs, and athletic and other University-administered programs. Accordingly, the University does not take into consideration personal factors that are irrelevant to the program involved.

Questions regarding access to programs following Title VI, Title IX, and Section 504 should be referred to the Affirmative Action Officer, 205 Garland Hall, 410-516-8075.
## 10. Faculty and Staff

### 10.1. Faculty

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<thead>
<tr>
<th>Name</th>
<th>Title</th>
<th>Department</th>
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<tbody>
<tr>
<td>Gregory S. Chirikjian, Ph.D.</td>
<td>Professor</td>
<td>Department of Mechanical Engineering</td>
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<tr>
<td>Marin Kobilarov, Ph.D.</td>
<td>Assistant Professor</td>
<td>Department of Mechanical Engineering</td>
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<tr>
<td>Noah Cowan, Ph.D.</td>
<td>Associate Professor</td>
<td>Department of Mechanical Engineering</td>
</tr>
<tr>
<td>Chen Li, Ph.D.</td>
<td>Assistant Professor</td>
<td>Department of Mechanical Engineering</td>
</tr>
<tr>
<td>Ralph Etienne-Cummings, Ph.D.</td>
<td>Professor and Chair</td>
<td>Department of Electrical and Computer Engineering</td>
</tr>
<tr>
<td>Nassir Navab, Ph.D.</td>
<td>Professor</td>
<td>Department of Computer Science</td>
</tr>
<tr>
<td>Gregory D. Hager, Ph.D.</td>
<td>Professor</td>
<td>Department of Computer Science</td>
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<tr>
<td>Jerry Prince, Ph.D.</td>
<td>Professor</td>
<td>Department of Electrical and Computer Engineering</td>
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<tr>
<td>Dennice Gayme, Ph.D.</td>
<td>Assistant Professor</td>
<td>Department of Mechanical Engineering</td>
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<tr>
<td>Russell H. Taylor, Ph.D.</td>
<td>Professor</td>
<td>Department of Computer Science</td>
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<tr>
<td>Iulian Iordachita, Ph.D.</td>
<td>Assistant Research Professor</td>
<td>Department of Mechanical Engineering</td>
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<tr>
<td>Rene Vidal, Ph.D.</td>
<td>Professor</td>
<td>Department of Biomedical Engineering</td>
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<tr>
<td>Jin Kang, Ph.D.</td>
<td>Professor</td>
<td>Department of Electrical and Computer Engineering</td>
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<td>Louis Whitcomb, Ph.D.</td>
<td>Professor and Chair</td>
<td>Department of Mechanical Engineering</td>
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<tr>
<td>Peter Kazanzides Ph.D.</td>
<td>Associate Research Professor</td>
<td>Department of Computer Science</td>
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<tr>
<td>Louis L. Whitcomb Ph.D.</td>
<td>Professor</td>
<td>Chair, Mechanical Engineering</td>
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<td>Department of Mechanical Engineering</td>
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10.2. Administrative Staff

Lorrie Dodd
Administrative Director
Office: 207 Hackerman Hall
Phone: (410) 516-0740
Email: ldodd@jhu.edu

Jamie Meehan
Budget Analyst
Office: 200 Hackerman Hall
Phone: (410) 516-3837
Email: jmeehan@jhu.edu

Alison Morrow
Academic Program Coordinator
Office: 200 Hackerman Hall
Phone: (410) 516-4639
Email: alison.morrow@jhu.edu

Julia Ortiz-Foy
Budget Analyst II
Office: 314A Hackerman Hall
Phone: (410) 516-0242
Email: jortiz@jhu.edu

Robert Schulze
Sr. Research Service Analyst
Office: 314 Hackerman Hall
Phone: (410) 516-0265
Email: rschulze@jhu.edu

Anita Sampath
Senior Academic Program Coordinator
Office: 200 Hackerman Hall
Phone: 410-516-6841
Email: LAKSHIMA@jhu.edu
11. Student Evaluation
11.1. Graduate Student Evaluation Form

M.S.E. in Robotics, Johns Hopkins University
Graduate Student Evaluation Form

Name: ____________________________  Calendar Year: _________

Responsible Conduct of Research course completed?  □ No  □ Yes  (When? ____________)

Part 1 - to the student: This form is intended to summarize your accomplishments in the past year and indicate your plans for the coming year. Please complete, sign, and discuss this with your advisor. Continue on as many sheets as necessary.

- Courses completed in the past 2 semesters:

- Planned courses for the next 2 semesters:

- Major research accomplishments, if thesis option (papers, conferences, etc.):

- Academic, research, and other goals in the coming year (advisor must agree):

- Your comments:

- Advisor’s comments:

I have reviewed this document with my advisor and I have seen his/her comments

Student signature  ____________________________  Date  ____________

Advisor signature  ____________________________  Date  ____________
Part 2 - to the advisor: This form is intended to guide a discussion with your student about their accomplishments, progress, and areas for improvement. This discussion is an opportunity to evaluate the student/advisor relationship and create a more effective research partnership. Below are several topics that should be covered in the discussion. Please think about these issues before meeting with the student. Space is provided for notes. Both you and the student will sign this form.

☐ Research (discuss if applicable: thesis topic, future publications, ability to conduct quality research, ability to think of and discuss new ideas, overall progress):

☐ Professionalism (discuss as applicable: conduct, presentation skills, writing skills, communication skills, teamwork):

☐ Logistics (graduation timeframe, progress towards students post-graduate goals):

☐ Educational Progress (academic progress, teaching opportunities, TA opportunities):

☐ Other (discuss as applicable) – Unaddressed student or advisor concerns
- Importance of research with respect to greater research community
- Students impressions of their progress

Student signature ___________________________ Date ___________

Advisor signature ___________________________ Date ___________

This completed Evaluation Form is due by the first day of Spring semester classes.