Joining the Zelik Lab
Guidelines & Expectations for Undergraduate & MS Research

Overview
We perform interdisciplinary research related to human locomotion, biomechanics and the development of assistive technologies such as lower-limb prostheses, exoskeletons and smart clothing. Research projects range from the designing, building and controlling robotic hardware to performing experiments on human subjects to writing computer code to analyze human movement data (often in Matlab) to developing computational models or software tools on the computer. We are excited to involve undergraduate and Masters students in these projects. Below summarizes the expectations and guidelines for applying to work in the BAT lab.

Who We Seek
We are interested in highly-motivated, curious, resourceful, enthusiastic, responsible and independent individuals. Due to the open-ended nature of research it is very different than typical academic courses. You will not be told exactly what to do each day, but you are expected to be self-driven, sustain progress on your project and incorporate feedback from Prof. Zelik, PhD students Post-doctoral researchers, clinical collaborators and research engineers in the lab. You are not expected to have field-specific research knowledge when you enter the lab, but you are expected to be resourceful and curious and to learn what you need to know for your project.

What You Would Do
As mentioned above, research projects and tasks can vary greatly. See the [Zelik Lab website](#) for some ideas of current/past projects, recent conference presentations and journal publications. If you join the lab we would attempt to identify a project that fits your interests, one where you could apply your specific skill set and develop new knowledge and skills. You would likely work closely with and/or be mentored by a PhD student or Post-doc in the lab. Initially you might help them with their research project(s) while you learn the skills and background needed to pursue your own.

Time Commitment (Fall/Spring)
You are expected to spend at least as much (or more) time on undergraduate research as you would on a 3-credit engineering course. During Fall or Spring term, this should be **12 hours per week** (i.e., 4 hours per credit hour). Research typically requires 1-2 semesters to get oriented to the lab and acquire basic skills and knowledge relevant to the field. Therefore, you should **be prepared to commit to a minimum of 2 semesters of research** (ideally sequential semesters, e.g., Fall-Spring).

Consistency
You must put consistent time into the project *every week*, regardless of other demands on your time, so plan your studying and work for other classes accordingly. It is a good idea to set aside for yourself fixed hours each week to work in the lab. Please consider carefully whether your class schedule allows this time commitment to research. If you have 18 classroom hours planned for the next semester, there are not many people who can juggle that load AND undergraduate research at the same time.

Weekly Reporting
At least once per week you will be expected to report to the PhD student or Post-doc with whom you are working, to describe your progress, accomplishments and struggles for the week, and your goals for the next week. This report may be in person or via email, whichever the PhD student or Post-doc prefers.

Course Credit vs. Paid Work
You can receive academic credit (ME 3860 for undergraduates, ME 7899 for Master of Engineering, and ME 7999 for Masters of Science students), or volunteer in the lab, or undergraduates can apply for a summer research fellowship ([Vanderbilt Undergraduate Summer Research Program](#) or [Vanderbilt University School of Engineering Summer Research Program](#)). You may be considered for paid work after 2 exemplary semesters working in the lab. Full-time summer research is also highly encouraged. There may be a limited number of paid positions available, or you can view links above for information on how to apply for your own summer research funding.

Grading & End of Semester Deliverables
Deliverables will vary depending on the project, but might include experimental results, a physical prototype, analysis software, and/or simulation results. At the end of the semester you will submit a final project report (in the format of a conference abstract/paper; a template will be provided), and you will give a PowerPoint presentation in lab meeting that summarizes your work. Generally, you will be graded on your participation, consistent progress throughout the semester and your final results/report.
Note: If you want to graduate with honors in ME, doing undergraduate research is a requirement, and this report must be submitted to the ME department chair. Prof. Zelik will only submit reports that are professionally written, demonstrate high quality work, and represent a project of adequate scope and completion. It will be at his discretion whether to submit your final report for consideration for ME Honors. If this is your goal, please let him know at the start of the term.

Milestones during the Semester
A semester is generally about 15 weeks long. This is not a long time when it comes to research projects. Thus, your first goal (to be completed during the first week or two of the semester), is to lay out a schedule for your project. Identify key milestones and specific goals (deliverables), and make a Gantt chart (if you don't know what this is, look it up, or talk to the PhD student you are working with). Share this with your PhD student of Post-doc collaborator, and then update this document throughout the term to track your progress and revise milestones as needed.

How to Apply (after you have read and considered the information above)
Please send an email to Prof. Zelik (karl.zelik@vanderbilt.edu) and CC Research Engineer Katherine Rodzak (katherine.rodzak@Vanderbilt.Edu) with the following format:

1. Subject Line
Please use this exact subject line (italicized below), to help us quickly organize and find these emails:
- *BAT lab research opportunities for XXXXX ####*
    - XXXXX = semester of interest (fall, spring or summer)
    - #### = year (e.g., 2018)

2. Body of Email
A single brief paragraph in the body of the email introducing yourself:
- who you are
- your year in school (e.g., sophomore)
- your expected graduation date
- your intended major
- your GPA (min 3.0, >3.5 preferred)
- your specific research interests
- which semester you would like to begin research
- your course load during the proposed research semester (# of credit hours if known, and an explanation of how research will fit into your schedule if this number is >15 credit hours)
- any relevant skills or information you would like me to know
- your contact information

3. Attachment
A single PDF attachment (which can contain multiple pages) with the following information:
- resume or CV
- college courses taken and grades (typed out or an unofficial transcript)
- short list of references and their contact information (2-3 is fine)
- A short essay (1 page or less) explaining why you want to do research, what *specific* types of projects excite you and/or what research skills (e.g., programming, experimental data collection, hardware development or testing) you are most interested in acquiring/developing, if you have any previous research experience or technical or skills (e.g., Matlab, LabVIEW, CAD) that would be relevant, and any other questions or comments you have, or information you would like us to know

When to Apply
You are welcome to apply at any time, but it is likely that Prof. Zelik will review applications ~2 months prior to each semester (e.g., in November to evaluate applications for the Spring term).

After Applying (What to Expect)
Depending on availability of projects, space in the lab, and the number of applicants, you may be invited to meet with Prof. Zelik and/or other lab personnel to discuss potential research opportunities and projects. Thanks again for your interest!