**Potential Students for the Swarm Control Lab:**

1. Browse through
   * YouTube channel: [youtube.com/aabecker5/](http://www.youtube.com/user/aabecker5/featured" \t "_blank)
   * Mathematica Demonstrations: [http://demonstrations.wolfram.com/author.html?author=Aaron+Becker](http://demonstrations.wolfram.com/author.html?author=Aaron+Becker" \t "_blank),
   * Gamification research: [www.SwarmControl.net](http://www.swarmcontrol.net/" \t "_blank),
   * and papers: [scholar.google.com/citations?user=6kGt1DEAAAAJ](acholar.google.com/citations?user=6kGt1DEAAAAJ)
   * Decide:
     1. Do any of these seem interesting to you?
     2. If so, do you have any tools or techniques that could be applied to these?
     3. Could you optimize something?
   * Do you already have a project?
     1. If so, can you show how it aligns with my lab's goals or interests?
2. Email a one-page document to Prof. Becker explaining
   * your potential project,
   * why you want to attack this problem
   * any skills you bring to the project
   * funding requirements. Funding MS students is very difficult, funding PhD students is difficult, but there are some opportunities every semester either through my grants or by applying to external sources.
3. Request a meeting with Prof. Becker, or visit during office hours (at least 12 hours after emailing description)

Our Research Role

The *Robotic Swarm Control Lab* is composed of Dr. Aaron T. Becker, PhD students, Master’s students, and undergraduate assistants.

Our **goals** are

1. To understand, quantify, and implement the best methods for controlling huge[[1]](#footnote-1) numbers of robots
2. To implement robotic solutions to medical problems
3. To train confident, productive, ethical engineers to perform impactful research

Our **success is evaluated** primarily on three criteria by the ECE department:

1. Quantity and diversity of external funding (grants and monetary awards)
2. Quantity and quality of journal articles (the prestige of the Journal and the number of citations we receive)
3. Quantity and quality of the PhD scholars who graduate from our lab.

Success is also measured

1. Quantity and quality of the Masters Students who graduate from our lab.
2. Patents secured by our lab
3. Conference papers
4. Awards (best paper)

Robotic Swarm Control Lab Covenant

My expectations for you, my graduate scholar:

1. You will be *available*:
   1. You will spend 20 *[10 for MS students]* cumulative hours in N386 or in my office during normal working time (between the hours of 8am to 5pm Monday through Friday). Our lab needs to spend time together so we can learn from each other
   2. Attend weekly lab meeting, give feedback on presentations
   3. You will inform me 7 days before you take a vacation
2. You will be *accountable*
   1. Turn in weekly progress reports (template here) 12 hours before one-on-one meeting
      1. Goals from last week
      2. Progress on these goals
      3. Deliverables
      4. Suggested goals for next week
   2. Schedule at least 1 weekly meeting with me (PhD 1 hr, MS ½ hr)
   3. Save and backup all work [code, data, LaTeX, images, videos]. Papers and code should be saved to our git server: <https://github.com/aabecker>
   4. Participate in a weekly lab meeting
3. You will be *balanced*
   1. Rest from research one day a week
   2. Spend time with your family
   3. Take 4 weeks of vacation per year
   4. Exercise two hours a week, eat healthily
4. You will be *proactive*
   1. Email, call or visit me if your research hits a roadblock (you need equipment, advice, instruction) as your advisor, I am here to guide and help you.

In return I promise to

1. Be *available*
   1. I will spend 20 hours per week in the lab or my office
   2. Have at least one meeting a week with you
   3. Hold a lab meeting once a week
   4. Reply to your email within 1 business day (2 business days for Masters students)
   5. Share my travel schedule with you
2. Be your *champion* in public
   1. I will pay for the lead author of a conference paper (IROS, ICRA, RSS) to attend and present
   2. To introduce you to my colleagues
   3. To bring you to local presentations
   4. Support you through quals, prelim, and defense
   5. Write honest, but glowing recommendation letter
3. Be your *critic* in private
   1. Give feedback on presentations, writing, illustrations, and procedures
   2. Performance review each semester

Scholar Name (printed) date (yyyy/mm/dd)

Student signature

Aaron Becker

Professor Name (printed) date (yyyy/mm/dd)

Professor signature

Robotic Swarm Control Goals

In five years, I want a lab characterized by

1. A *fun*, *exciting*, and *productive* atmosphere
   1. Members teach each other (teaching someone is the best way to learn a subject)
   2. Lab will eat together at least once a week
   3. Lab will be cleaned at least once a week
   4. We celebrate successes (qualification exams, paper/grant acceptance, prelims and defenses)
   5. Honest and ethical (including software—we pay for software)
   6. Safe work practices (using personal protective equipment (PPE), the buddy system, have safety gear, and al members undergo safety training.
2. Always ready for a live demo
   1. Robotics is fun, and our lab will be a stop for many tour groups
   2. Take a picture of groups that visit
   3. Use visitors for an experiment
   4. Give a handout for visitors (current handout is a maze game with our contact information)
3. Bookshelf of successes (PhD dissertations & Master's thesis)
   1. Always have a paper at the main robotics conferences (IROS, ICRA) because these are networking opportunities
   2. Convert all conference papers as journal articles
   3. Publish in best conferences (RSS, WAFR, DARS)
   4. Publish in best journals (TRO, IJRR)
   5. Save & backup all data, code, and LaTeX
   6. Record high quality videos for each paper using a tripod, also post online
   7. Sharing data/code/papers in a repository system (such as github, final versions in arXiv)
4. Poster that records successes (and our lab goals)
   1. Patents
   2. Win best paper awards
   3. Science/Nature publications
   4. Medical animal trials
   5. Medical human trials
   6. Commercial products
   7. PhD graduates
      1. PhD graduate in Academia
      2. PhD graduate in Industry
      3. PhD graduate in Research
   8. Coauthors in famous labs

1. *Eventually, 1016 robots* [↑](#footnote-ref-1)