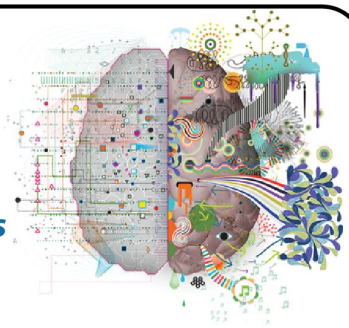
National Institute of Biomedical Imaging and Bioengineering

Georgia Tech & Emory University Computational Neuralengineering Training Program (CNTP)

Training the Next Generation of Neuroscientists For Innovation, Exploration, & Cures



ML@GT Machine Learning at Georgia Tech

School of Electrical and Computer Engineering · Georgia Institute of Technology

Georgia Tech | Emory University

Wallace H. Coulter Department of Biomedical Engineering
Georgia Tech College of Engineering and Emory School of Medicine

Georgia Tech Neural Engineering

Emory University | Neural Engineering

Georgia Tech BioEngineering

Trainee Handbook

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Georgia Tech & Emory Computational Neural-engineering Training Program (CNTP) Trainee Handbook

The CNTP is an NIH funded educational and research training program in Computational Neural-engineering across Emory University and Georgia Tech. This is funded specifically through a T32 Training Grant from the National Institute of Biomedical Imaging and Bioengineering (NIBIB), and the program officer Dr. Zeynep Erim. Starting in the Fall of 2019, the program funds 4 new PhD students each year (combined, from BME students on the Emory side, and BME, ECE, BioE, or ML students on the GT side). The purpose of this handbook is to provide some basic information about the activities of the program (coursework, rotations, etc.) and how the program is mediated (stipends, training expenses). For additional information, contact the training grant PI Garrett Stanley (garrett.stanley@bme.gatech.edu) at Georgia Tech or Co-PI Lena Ting at Emory (lting@emory.edu).

Contact Information:

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Description of the Training Program

Trainee Categories
Two categories of trainees across Georgia Tech and Emory are invited to participate in the program.

CNTP Fellows are financially supported by the NIH training program for their tuition, stipend, and travel funds. CNTP Fellows are selected in their first year of the PhD, must be US citizens or permanent residents, and matriculate into one of the following graduate programs: 1) Joint Georgia Tech and Emory Biomedical Engineering PhD program, 2) Georgia Tech Bioengineering PhD Graduate Program, 3) Georgia Tech Electrical and Computer Engineering PhD program, 4) Georgia Tech Machine Learning PhD Graduate Program. CNTP Fellows are required to participate in all of the 8 of the training program elements listed below. **Important:** Upon joining the program, all Fellows need to be entered into the NIH ERA Commons xTrain database – please see Terry Kauffman to ensure that you will receive funding.

CNTP Scholars are not financially supported by the program and invited to participate in many of the unique training elements. CNTP Scholars are selected in their first year of graduate school, but do not have any citizenship or departmental requirement; they are expected to be graduate students in the labs of participating faculty. CNTP scholars are expected to participate fully in training elements 3-8. In particular, CNTP Scholars are given access to the restricted Clinical Experience for Engineers course in the summer of their first year.

1) Laboratory research rotations in the first year: Fellows will have the unique opportunity to have research rotations in their first year. Fellows are required to complete 2 research rotations in the labs of Training Faculty in their first two semesters of graduate school (see the last page of handbook for a current list of training faculty).

Fellows should spend the first several weeks upon arrival interviewing with candidate faculty and laboratories. Fellows do not need to participate in their respective programs' matching process, but do need to inform their program's coordinators that they are part of this training program. Fellows should enroll in research units with one of the CNTP leadership team (Stanley, Ting, Rozell, Borich) for the Fall and Spring semesters of the first year.

The rotations are 4 months long (Sept-Dec for Fall, Jan-Apr for Spring). The nature of the rotation should be agreed upon between the fellow and rotation advisor, and a semester-end final presentation and report are strongly encouraged. Fellows will also need to report on the rotation in their Semester Training Report (see below). The goal of the rotation is to get exposure to the research of the lab, get to know the PI, lab members, and identify potential thesis-work laboratories. Rotations that promote collaborations between labs are also encouraged. Please let Terry Kauffman know the intended rotations once determined.

2) Selection of thesis-work laboratory. In the summer at the end of the first year, fellows will select one Training Faculty member to serve as their thesis advisor. All trainees (fellows and scholars) are encouraged to designate a Clinical or Data Science Co-mentor, whose research expertise complements that of the thesis advisor and is beneficial to the trainee's research project. Fellows will be expected to attend lab meetings of both labs for the summer and through their second year. In our prior experience, such an arrangement has led to innovative new collaborative projects that have subsequently been funded by both individual fellowships to the trainees, as well as new collaborative research grants to the PI's, allowing for sustained research in these areas. In this sense, the trainees drive the new collaborative directions.

Upon selection of a thesis-work laboratory, the fellow will need to sign up for their thesis advisor's research hours.

3) CNTP Committees. All trainees are expected to participate in committees to help create a community driven experience. Committees include, but are not limited to: CNTP Forum Committee, CNTP Annual Events Committee, CNTP Recruiting & Outreach Committee, and CNTP Communications Committee.

CNTP Forum Committee – This committee is charged with planning and holding a monthly CNTP Forum (virtually until further notice) that serves as the primary, ongoing interactions between CNTP trainees, CNTP

faculty, and others in the GT/Emory community and beyond in Computational Neuralengineering and related fields. The focus can shift across scientific/technical discussions, career development, ethics, industrial opportunities, and any other topics that serve the trainees – however, 50% of the activities must be scientific/technical in nature. We further strongly encourage highly interactive activities, such as hands-on workshops, and other engaging platforms. **Faculty Advisor:** Garrett Stanley

CNTP Annual Events Committee – This committee is charged with planning and holding annual CNTP events, such as the Annual CNTP Retreat, Research Expos, Hackathons, etc. These activities should be a balance between scientific/technical focused events, and other community building and career development events. **Faculty Advisor:** Lena Ting

CNTP Recruiting & Outreach Committee – This committee is charged with participating in the recruitment of new CNTP trainees, with an emphasis of broadening participation to underrepresented groups. This committee is also charged with developing outreach activities (possibly in partnership with other groups) to communicate and educate broadly about the potential impact of neuralengineering research. **Faculty Advisor:** Chris Rozell

CNTP Communications Committee – This committee is charged with broad communications of CNTP activities, including website, twitter, Facebook page, etc. **Faculty Advisor:** Michael Borich

4) Coursework. As part of the training program, trainees are required to take coursework across several areas-much of which is part of their homeschool program.

Coursework in Computational Neural Engineering: Trainees will be required to take 3 courses (9 credit hours) in the area of computational neural engineering, most taught by our participating faculty. All of the Ph.D. programs are flexible enough for students to apply these courses to their degree programs without delaying their progress. Currently, four courses are offered that may count toward the Computational Neural Engineering Coursework, listed below.

Computational Neuroscience (BMED 7610, Stanley/Pandarinath). This is an upper-level graduate course, attracting students from BME, ECE, Physiology, Psychology, and Neuroscience, and other units across GT and Emory University. This was a core course in the prior CNTP. The course is designed to provide a rigorous and in-depth survey of systems level neuroscience, framed through models that span from single neurons, to neurons synaptically connected in small networks, to information-based modeling approaches, to networks capturing aspects of plasticity and learning. The course utilizes MATLAB programming throughout as a tool to create simple models, run simulations, and analyze data.

Information Processing Models of Neural Systems (ECE 6790/BMED 6790, Rozell). This course examines "top down" modeling approaches, where an optimal computational principle used in engineering (e.g., information theory, Bayesian inference, resource allocation, control theory) can account for the observed information processing strategies in a neural system. The models are explored in levels of abstraction ranging from the anatomy of single neurons to human sensory perception and motor control.

Introduction to Computational Neuroscience (Emory Integrative Biological Systems 534, Berman). This course explores the dynamics of single neurons and biological neural networks with computer simulations. Each class consists of an introductory lecture followed by computer tutorials using the GENESIS software under UNIX. Specific topics include passive cable theory, compartmental modeling, voltage-gated and synaptic conductances, motor pattern generation, and cortical networks.

Computational Neuromechanics (BMED88X3). This is a graduate level course using engineering and robotics methods to understand the interactions between neural control and biomechanics of human movement. We will read principles of neuromechanics from a recent textbook, implement and analyze neuromechanical models in simulations, and read relevant papers from the primary literature. The implications of neuromechanical interaction neurological disorders will be discussed based on literature and a class project.

Machine Learning for Biosciences (BMED 6517, Peng). This course introduces machine learning concepts and methods. The course is targeted to graduate students in Biomedical Engineering, Bioinformatics, Computer Science, Electrical Engineering and related disciplines, and also qualified undergraduate students. Topics to be covered include supervised and unsupervised learning, dimension reduction and visualization. Topics will be accompanied by research papers in the bioinformatics domain, relating algorithms to biological applications

Coursework in Clinical, Scientific, and Technological Integration: All trainees will take two unique courses intended to introduce them to the broader context and application of computational neural engineering advances.

Clinical Experience for Engineers (BMED 8823, Ting)**.** Trainees will participate in a unique immersive clinical course in the summer of their first year, limited to trainees and affiliated scholars who complete all training components. Students spend about 50 hours in clinical settings, including brain surgery for placing deep brain stimulation (DBS) leads, DBS programming sessions, epilepsy monitoring, neurorehabilitation, sleep monitoring, EEG in anesthesiology, comprehensive care clinic for Parkinson's disease, etc. They will also attend grand rounds and patient support groups. Students will receive training in narrative reflection, public scholarship, neuroethics, and will produce short writing pieces that will be made public on the course website to share their experiences and perspectives about neural technologies publicly. They will also be expected to give short presentations about neural engineering to patient support groups. We believe this early experience will be beneficial to the current and future research of trainees regardless of their research projects.

Advanced Seminar in Neuropathology and Neuroengineering (BMED 7601, Pardue). This is a required course for BME students in Neural Engineering, that is open to graduate students beyond the first year. Students learn to read and contextualize current literature in neural engineering in terms of clinical, scientific, and technological challenges, and to communicate these ideas through oral and written avenue to different stakeholders. Class is discussion-oriented and assignments are focus writing a News and Views of a current paper and oral presentation skills. This course provides essential training in meta-skills important for a career in scientific research, along with critical evaluation of contemporary advances in neural engineering.

(Required for BME students) Integrative Core 2: Experimental Design & Measurements at Appropriate Spatial and Temporal Scales (BMED 7012, Haider). This course will develop critical thinking skills necessary for performing independent research that integrates across engineering and biology. Students will learn to justify and critique scientific assertions across these domains through open-ended discussion and critical feedback sessions. This course specifically develops a foundation for experimental design that integrates technical considerations of spatial and temporal sampling with scientific justification and knowledge of limitations from current literature. Students will learn to present their work orally and develop a written proposal.

5) CNTP Forums: Once per month, all trainees affiliated with the program will meet in a group with various training faculty members to discuss papers, methods, and challenges in neural engineering. Each trainee is required to make at least one presentation in this forum during their tenure. Trainees are encouraged to shape this event to meet the needs of the group and be creative in the format.

6) Annual Program Retreat: To promote program cohesion, personal connectivity, ethics training, and research presentations we hold an annual program retreat spanning a full Saturday including an evening party. The retreat takes place around the third week of September just after the start of the fall semester and is open to trainees from the labs of our participating faculty working in computational neural engineering and related fields. The schedule at this retreat is balanced to allow time for both professional presentations and discussion, and for social time such as playing Volleyball. The retreat brings together, faculty, graduate students, and undergraduate students in multiple training programs related to computational methods in neuroscience. Each 2nd year student gives a short presentation on their research project. Program Faculty are expected and the Leadership Committee Members obligated to attend.

7) Seminars, Innovation Forums, and Workshops: Trainees will be expected to attend research seminars approximately weekly throughout their training through a number of avenues on the Georgia Tech and Emory campuses. For most of the external speakers that visit, student have an opportunity to discuss a paper in journal club prior to the talk, and to meet with speakers.

The **GT Neuro Seminar Series** (http://neuro.gatech.edu/gt-neuro-seminar-series) is a weekly seminar established in 2016 hosted by the GT Neural Engineering Center. It is videocast to Emory and archived online. Students are given the opportunity to meet with all speakers after their seminars.

The **Innovation Forums** are hosted about every 6 weeks and are curated to encourage open dialogue and discussions between clinician-researchers and engineers to spark new collaborations.

There are many other optional seminar series across both campuses that out students may attend include: Frontiers in Neuroscience at Emory, Petit Institute Seminars in Bioengineering, Robotics Research at Georgia Tech, Brown Bag Seminars in Applied Physiology at Georgia Tech, Seminars in Cognitive and Visual Neurorehabilitation at the Atlanta VA, Seminars in Integrative Neuroscience, Udall Seminar in Parkinson's Research, Translational Rehabilitation, and Biomedical Informatics.

8) Reporting, Publications, etc.

Trainees are required to submit progress reports at the end of each semester. For fellows, funding for the subsequent semester is contingent upon submission of the report, and for all trainees, continued membership is contingent upon receiving reports.

Any publications, conference abstracts, conference proceedings, etc. should acknowledge the funding through this mechanism with a statement such as "[Your name] was supported by the Georgia Tech/Emory NIH/NIBIB Training Program in Computational Neural-engineering (T32EB025816)".

We also want to know (and need to know) about your successes! Within and beyond the training program, we will have a mechanism for you to report progress in your degree programs (passing qualifying exam, proposing thesis, defending thesis, etc.), publications (conference abstracts, conference proceedings, journal articles, etc.), fellowships and awards (e.g. NIH Pre-doctoral NRSA, NSF GRFP, etc.), and collaborations with other labs (especially within the CNTP, but also beyond). These successes, when we communicate them to the NIH, will help us get more resources, to help other students like yourselves. So, please help us! In addition to the semester formal progress reports, please let Terry Kauffman know of any of these successes!

Example of Individual Training Programs

All Georgia Tech Ph.D. students submit a Program of Study form during the first semester in residence. The Program of Study lists the coursework that a student intends to take to fulfill the degree requirements. The Program of Study, which can be revised at any point, provides an efficient tool to plan and monitor student progress through the degree coursework requirements. All doctoral students at Georgia Tech must complete RCR training. Courses that fulfill training program requirements are indicated by italics

Joint Emory/Georgia Tech Biomedical Engineering PhD Program

Requirements (credit hours)	Courses (credit hours)
Integrative Core Course (3)	BMED 7012 (3): Spatial and Temporal Scales of the Nervous System
Engineering and Bioscience (18)	IBS 526 (7): Systems Neuroanatomy and Neurophysiology IBS 524 (3): Cellular Neuroscience ECE 6550: Linear Systems and Controls ***BMED 7610 (3): Quantitative Neuroscience*** ***ECE 6790 (3): Information processing in neural systems*** ***BIO 640 (3): Quantitative Neuroscience***
Advanced Seminar (3)	***BMED 7601 (3): Advanced Seminar in Neuropathology and Neuroengineering***
Minor (9)	***BMED 8823 (3): Clinical Experience for Engineers***
Seminar Participation (4)	***Students may select from any campus seminars***
Teaching Assistant Series (4)	BMED 7001/7002 Teaching Training and Practicum
Values in Science (1)	PSI 600, ***4 Neuroethics seminars***

BME Qualifying Exams occur in the fall of second year. Students work with the graduate committee in the Spring of the first year to select a qualifying exam committee of 3 faculty members, reflecting a balance of engineering and biology, and a member of the graduate committee. The faculty are anticipated to be candidates to serve on the PhD thesis committee. Students write a brief proposal during the first summer and have a 1.5-2 hour oral examination based on the proposal and their completed coursework.

GT Interdisciplinary Bioengineering PhD Program

Requirements (credit hours)	Courses (credit hours)
Engineering Fundamentals (9)	ECE 4270: Fundamentals of Digital Signal Processing ECE 6250: Advanced Digital Signal Processing ECE 6254: Statistical Signal Processing
Engineering Math (3)	MATH 6643: Numerical Linear Algebra
Biological Science (9)	IBS 526 (7): Systems Neuroanatomy and Neurophysiology ***BMED 7610 (3): Quantitative Neuroengineering*** ***BIO 640 (3): Quantitative Neuroscience***
Bioengineering Technical Electives (9)	***BMED 8823 (3): Clinical Experience for Engineers*** ***BMED 7601 (3): Advanced Seminar in Neuropathology and Neuroengineering*** ***ECE 6790 (3): Information processing in neural systems***
Seminar Participation (4)	***Students may select from any campus seminars***
Teaching Assistant Series (4)	BMED 7001/7002 Teaching Training and Practicum

BioE Qualifying Exams take place at the beginning of the Spring semester of their second year. This oral examination (1.5-2 hours), conducted by a committee of three BioE faculty members who do not serve as the student's advisor, is structured to assess: (1) the student's ability for independent thinking, decision making, and coherent communication; (2) knowledge and integration of engineering and biological concepts; and (3) the application of this knowledge to interdisciplinary bioengineering problems.

GT Electrical and Computer Engineering PhD program

Requirements (credit hours)	Courses (credit hours)
Major area in ECE (9)	ECE 4270: Fundamentals of Digital Signal Processing ECE 6250: Advanced Digital Signal Processing ECE 6254: Statistical Signal Processing
Breadth area in ECE (9)	ECE 8803: Implantable Microelectric Devices ***ECE 6790: Information Processing Models in Neural Systems***

	ECE 6200: Biomedical Applications of MEMS / ECE 6786: Medical Imaging Systems
Minor in an area outside ECE (9)	***BMED 8823: Clinical Experience for Engineers*** ***BMED 7601: Advanced Seminar in Neuropathology and Neuroengineering*** ***BMED 7610: Quantitative Neuroscience***
Electives (12)	***IBS 534: Computational Neuroscience*** CS 7641: Introduction to Machine Learning PSYC 4803: Neuroethics APPH 8803: Movement Disorders
Professional Communication (4)	ECE 8802: Professional Communications Seminar

ECE Qualifying Exam: ECE students have 3 opportunities to take the (written) prelim exam in the first 4 semesters.

GT Interdisciplinary Machine Learning PhD Program

Requirements (credit hours)	**Courses (credit hours)**
Core Curriculum (15)	CS/ECE 7740: Mathematical Foundations of Machine Learning ECE 7251: Signal Detection and Estimation ECE 6273: Methods of Pattern Recognition with Applications to Voice CS/ECE 7741: Probabilistic Graphical Models and ML in High Dimensions ECE 8823: Convex Optimization: Theory, Algorithms, and Applications
Area Electives (15)	BMED 6700: Biostatistics CS 7280: Network Science CS 7545: Machine Learning Theory ***ECE 6790: Information Processing Models in Neural Systems*** ***BMED 7610: Quantitative Neuroscience***
Doctoral Minor (9)	***BMED 8823: Clinical Experience for Engineers*** ***BMED 7601: Advanced Seminar in Neuropathology and Neuroengineering*** ***ECE 8803: Implantable Microelectric Devices***
Qualifying Examination (3)	1 semester literature review

ML Qualifying Exam: ML students perform a literature review during the second semester of the second year, culminating with an oral examination.

Other optional professional development opportunities at Georgia Tech and Emory

Mentoring Experience: The opportunity to gain mentoring experience and to be advised in mentoring skills is also an important component of graduate education as such skills are essential to establish a successful research laboratory later on in their career. In the third and later years of their training our students will also be expected to mentor undergraduate research projects. Undergraduates at Georgia Tech work on both campuses and have opportunities to apply for funding through the President's Undergraduate Research Award. Further, undergraduates on both campuses may participate in the Petit Scholars Program, which sets up a formal mentoring relationship and more structured quarterly reports, which enhances the mentor-mentee relationship.

Optional formal training in "Mentoring in Research" is available through a 6-8 session seminar series for graduate students and postdoctoral fellows at Emory University. The seminar based on Dr. Jo Handelsman's *Entering Mentoring* book, which is targeted at graduate students and postdocs who are often the frontline mentors for undergraduates. The objectives include developing skills in communication, working effectively with students with diverse learning styles, experiences, ethnicities, nationalities, and building mentoring communities who can share best practices on responding to mentoring challenges.

Presentations at Local and National Venues: Students in BME are required to present in BME student seminar and at a variety of poster sessions for recruiting and other events. An Atlanta wide poster-preview session before the annual SfN meeting provides another important opportunity for all to present and obtain feedback. There are also many local opportunities for students to present their research in seminars across multiple departments.

All students in the CNTP are encouraged to present at National and International meetings, and our prior trainees have succeeded in this goal. Conferences that are regularly attended by participating program faculty include the Computational Neuroscience (CNS), the Society for Neuroscience (SfN), Computational and Systems Neuroscience (CoSyNE), and IEEE EMBS meetings.

Outreach Opportunities: Based on the requests of our past trainees, we are incorporating opportunities for outreach activities in neuroscience. These opportunities will give our students a chance to practice communication about science with the general public, which is also important in grant applications and in talking about their own research. Two of our past trainees initiated outreach programs to a middle school in Atlanta whose students are predominantly URM. Many more outreach activities are available through the Bioengineering and Bioscience Unified Graduate Society (BBUGS), through Brain Awareness Week hosted by the Atlanta Chapter of the Society for Neuroscience, and the Atlanta Science Fair. Additionally, we will engage undergraduates at Morehouse College and Spelman College through events and through the short courses.

Other Opportunities for Professional Development: Georgia Tech and Emory offer a number of other programs that our students may opt to participate in throughout their PhD training.

Broadening Experiences for Scientific Training (BEST) program (http://best.emory.edu), a collaboration between Emory University and Georgia Tech. This program provides career-exploration resources and professional development activities to predoctoral and postdoctoral scientists and engineers targeting the biomedical workforce. Essential to this process is a change in the culture and conversations around PhD training in order to encourage and celebrate the variety of career outcomes and opportunities that PhD graduates have available.

GT Graduate Leadership Program: All of our trainees will be eligible to apply to participate in this unique year-long program focused on facilitating dialog and learning about values-based leadership awareness and skills. This program, comprising a small group of graduate students (<20) and co-facilitated by the Director of the Institute for Leadership and Entrepreneurship and the Director of Learning Science, involves a series of roundtable activities and a two-day retreat designed to enhance understanding of leadership as well as personal and organizational values. The training is designed to enhance the leadership and organization skills of trainees.

GT BME's Preparing Future Faculty is a joint initiative between BME and the Center for the Enhancement of Teaching & Learning (CETL). The overarching goals of BME PFF are to provide doctoral biomedical engineering students and post-docs with opportunities to experience the various aspects of a career in academics, and to gain early exposure to some of the core competencies required. Participants in this two-year program gain various tools and knowledge along the three pillars guiding this initiative: 1) teaching, 2) specialized skills in

research communication, and 3) career development. Both instructional and hands-on training in these areas allow participants to develop a highly focused academic tool kit they can take with them in their future careers.

Finances – Only Applies to Fellows

The training grant provides stipend support, tuition support, and support for training related expenses (including travel).

Fellows need to obtain an NIH Era Commons login during the first year, and be entered into the T32 trainee list in Era Commons – please see Terry Kauffman for details.

Tuition & Stipend. We will work with your homeschool to ensure that the funding is lined up, and that this should just be taken care of. If there are any problems, please contact Prof. Stanley if you are supported on the GT side, and Prof. Ting if you are supported on the Emory side.

Upon ending the CNTP/T32 financial support period, fellows will need to coordinate the transition of funding from the CNTP to their advisor's finances or to another fellowship. Please see Terry Kauffman for information regarding this transition.

Each fellow is provided with funds for training related travel and other training related expenses. If you are supported on the GT side, please work with Terry Kauffman (terry.kauffman@bme.gatech.edu) to access these funds, and if you are supported on the Emory side, please work with Amanda Johnson-Scott (amanda.marie.johnson-scott@emory.edu) to access these funds. It is important to confirm that the expenses are allowable, and that you are following the right procedure to make spending the funds or being reimbursed from the funds as smooth as possible. **It is also important to spend any funding by the end of June**.

Travel Expenses. Each fellow is provided with $1375/year for travel expenses. These funds are to be used for travel to scientific conferences, workshops, summer courses, etc. If not one of these types of travel, please consult with program directors to see if allowable.

Training Expenses. Each fellow is provided with $4200/year for other training expenses. This can be used to supplement travel (see above), or for other things like a laptop computer, software, textbooks, etc. that are needed for your training. The fellow may use their professional development funds to pay for the health insurance offered at the institution they are paid by (Emory or GT).

Semester Training Report. All trainees are required to complete an on-line, web-based Semester Training Reports which will be sent to you. Your timely and accurate completion of the report will help us improve the program and seek continued funding. All trainees will be contacted at the end of each semester and are expected to fill out the report in a timely manner. The reporting will continue throughout each trainee's PhD.

Below is a listing of the CNTP faculty:

FACULTY	INSTITUTION	DEPARTMENT/SCHOOL	EMAIL	PHONE
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Chris Rozell	Georgia Tech	Electrical & Computer Engineering	crozell@gatech.edu	404 385-7671
Eva Dyer	Georgia Tech	Biomedical Engineering	evadyer@gatech.edu	404 894-4738
Garrett Stanley	Georgia Tech	Biomedical Engineering	garrett.stanley@bme.gatech.edu	404 385-5037
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