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The Atlas

*An Entirely Student-Driven Guide to the
Program in Neural Computation (PNC) and
Program in Systems Neuroscience (PSN) of
the Neuroscience Institute at Carnegie Mellon
University*

To you, the reader.

*Science does not exist
without Graduate Students.*

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Disclaimer

As implied in the title, the contents of this guide are written *for* graduate students of the PNC and PSN *by* graduate students of the PNC and PSN.

The contents of this guide **do not** represent any formal or official position(s) held by the Neuroscience Institute, Dietrich College of Humanities and Social Sciences, the Center for the Neural Basis of Cognition, the faculty and staff who represent these institutions, nor Carnegie Mellon University as a whole. As such, any questions, comments, or concerns about its content should be directed to the current maintainers of *The Atlas*, whose information can be found [here](#) (link)

Preface

Graduate school is a *Choose Your Own Adventure* of high highs, low lows, and many million emotions in between. We (NISO at-large) feel that the CMU NI, with its deep roots in iconic fields of research spanning countless relevant fields to cognitive science and computational neurosciences – namely in computer science and computational thinking – is a uniquely attractive institution to train in Computationally-driven hypotheses and methodologies. Our sister school and co-founder of the Center for the Neural Basis of Cognition (CNBC) The University of Pittsburgh is a Tier 1 Research Institution, and its hospital system, The University of Pittsburgh Medical Center (UPMC), unite to make Pittsburgh and these programs in particular especially attractive. It's a good place to follow your greatest adventures!

Staff and administrators, bless them, serve a fundamentally different role within the Neuroscience Institute (NI). With it being early days of the new Institute's foundation, we want to develop a strong student culture from the offset. A common request from students of the PNC and new PSN programs is some form of support – whether it be FAQ, how to move to Pittsburgh, etc., all compiled in one place. That's where *The Atlas* comes in!

Its origins can really be traced back to PNC/ML's Arish Alreja, a former colleague and large inspiration for the birth of this idea (originally as a Plan of Study to navigate the PNC/ML track specifically). I owe him a crumpet! Thanks, Arish.

For some, Graduate School is a cakewalk. For others (like me!), it's a struggle for a while until you find the right recipe, so to speak. I wish this guide existed for me, basically.

Longer version in the official 1.0 release for May 2022!)

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Joint Program in Neural Computation and Machine Learning

Part I

Prospective Students



1

Organizational Structure

Tomas Suarez Omedas

VP of Student Life

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In the marvelous CMU-verse, there are many organizational bodies that coexist and interact with one another. We will discuss some names and acronyms that you might have encountered or will encounter in this conglomerate: CNBC, NI, CNUP, Dietrich College.

1.1 Neuroscience Institute - CMU

The Neuroscience Institute (NI) is the main organization that the students of the PNC and PSN belong to. As of the moment of this writing, the NI does not have undergraduate program(s), so it is comprised of the graduate students in the PSN and PNC, plus the professors of several departments with neuroscience-related research. The NI students are organized by the Neuroscience Institute Student Organization (NISO) which is an organization made by and for CMU neuroscience students.

1.2 The Dietrich College - CMU

For reasons that escape our understanding, the NI belongs to the Dietrich College of Humanities and Social Sciences, **not** to Mellon College of Science.

Other departments/institutes in Dietrich College are History, English, Philosophy, Economics and more. Maybe you would think that we should always be surrounded by scientists and that this is a waste of time, but actually Dietrich people are very nice and make fun events. Not all in life is science.

1.3 Center for the Neural Basis of Cognition - CMU & Pitt

Probably the most complicated structure of all, the Center for Neural Basis of Cognition (CNBC) is a cross-institution *hub* that serves as platform for all neuroscience researchers to share data and progress, talk, collaborate and keep one of the largest neuroscience communities in the nation. To join the CNBC, the students of most programs need to take four specific classes and then they get their CNBC certificate. In the case of NI students, we form part of the CNBC automatically just by being part of the NI (we still have to pass the courses). All members of CNBC get \$1,000 to buy a new computer and some years the NI gives first year students an additional \$750 to improve the power of that computer. Because of the CNBC's collaborative qualities, NI students have access to all of the neuroscience related labs at CMU *plus* all Pitt labs that are part of the CNBC and access to any Pitt class relevant to student's interests and research. Being part of a lab at Pitt (even if it is your primary research lab) does not change your status as a NI and CMU student in any matter like program requirements, facility access, etc.

1.4 Center for Neuroscience University of Pittsburgh - Pitt

The analog of the Neuroscience Institute at Pitt is the Center for Neuroscience University of Pittsburgh (CNUP). They have access to the same labs and research resources that NI students do. The two main differences of NI to CNUP are that NI programs have a stronger computational-oriented perspective and that CNUP has many more classes to take through the whole program compared to NI. In any case, they are a nice bunch and good people to get beers with.

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Why CMU and Pittsburgh?

Tomas Suarez Omedas

Emperor of Student Life

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Our first impulse to answer that question was "Why not?" but then we figured that it would probably be a good thing to have actual answers here, so here we go.

2.1 Program funding/support

Ph.D students in the NI have an stipend of 33K a year at the time of this writing. In total honesty, we will not talk here of how much we are truly due but 33K is in the high end of the Ph.D stipend spectrum. If you want to talk about how much we are due find a beer and contact the authors of this Atlas to get a nice afternoon of ranting. See section 2.4 to see why the cost of living makes this stipend be more efficient.

2.2 A unique place for science

For the non-lazy readers that went over Chapter 1, you know that there are many, *many* organizations in different levels. The actual purpose of that many acronyms is to bring many people (and its a lot of people) into what is sometimes called a *neuroscience hotbed*. It is ridiculous the amount of labs, ques-

tions, seminars and journal clubs available to every single CMU NI student. Adding the hotbed ingredient with a glorious easiness of collaboration plus knowing that the labs around here have a lot of money for top-notch equipment, we can say that the science at the NI is unique and fantastic.

2.3 About Pittsburgh (general)

In the unilateral vision of the author of this section, Pittsburgh is a *sweet spot* in terms of most things that you can measure a place to live with. It is the sweet spot between a big city and a town, not too big to be overwhelming and expensive but not too small to feel like there is barely anything to do. It is the sweet spot between a college town and a city without big schools, the student population is large but at the same time there is a lot of non-student-related activities and people in the city. It is a sweet spot in traffic and mobility, moving with a car is easy and not prohibitive by traffic but at the same time it is very easy to move around by public transport, walking and biking. It is a sweet spot... alright you probably get the point. To summarize in one sentence: Pittsburgh is a city that is big and diverse enough for you to never be bored, but not too big and frantic for you to be distracted/overwhelmed. For a more detailed picture of how is life in the city, check section [3.2 Living in Pittsburgh](#)

2.4 Cost of living

Living in Steel City is an exciting, cool and *affordable* experience. A quick survey of CMU peers tells us that we live with our 30K stipends comfortably. Most of us can pay rent, groceries, entertainment and dinning with that income alone, which truly cannot be said for many urban-based institution in the US. Rent is much, much cheaper than rent in bigger cities. One bedrooms and studios in the student-dense areas usually range in the \$900-1300, and if you don't mind sharing with roommates then the rents come around \$700-1200 a month. You don't believe us? Then check out [Apartments.com](#) and look for apartments in Shadyside, Squirrel Hill and North Oakland.

Besides rent, Pittsburgh is an amazing place in terms of cost of living and purchasing power adjusted to cost of living. On [Numbeo Database](#) you can see that Pittsburgh's index for rent is very low and the purchasing power index is very high.

3

Arriving and Moving to Pittsburgh

Tomas Suarez Omedas

Your friendly Student Life neighbor

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Welcome to the amazing metropolis of Pittsburgh. If you have questions of how to get here from air or land, questions of how to move here or 8 minutes to kill, we recommend you to read this chapter.

3.1 Arriving to Pittsburgh

“nobreak

3.1.1 Driving

Just put the address on Google Maps, not that complicated. Also, most Pittsburgh streets are both-ways single lanes. That gives rise to the famous [Pittsburgh left](#). Read that link if you plan to drive in Pittsburgh.

3.1.2 Flying

Coming from Pittsburgh International Airport is a very easy and painless form of travel. Once you arrive at PIT, you can choose to get to the city by Uber/Lyft or by bus. If you want to use the bus go to the lower level (where the baggage carousels are) and look for a sign that says door 6 (the sign is outside on the opposite side of the 7-Eleven) and wait for the bus. Use the [Transit](#)

[app](#) to track the 28X bus, and each ride costs \$2.75 in cash. Recommendation: Get a snack from 7-Eleven while waiting. If you are taking Uber/Lyft go to the same door and get message the driver that you'll be on the lower level. They might say that the upper level is best for them, so make sure you the driver knows where you are.

3.2 Living in Pittsburgh

You'll find (or have already found) that Pittsburgh is a very walk-able and well connected small city. The city is organized by having one street (also called strip) in most areas-towns, each having their own personality and combination of dining places, bars, clubs and more. There is always a new place to look and some unique specialty you haven't tried yet, which makes the life outside of campus very interesting and local-oriented at the same time. Most restaurants in the city are small locally-owned businesses which contributes to the personality and charisma of the city itself. It is a city that always has something to do in terms of outdoor activities, concerts, dining, entertainment and more while not having monumental traffic jams and non-stop big-city frenetic activity.

3.3 Do I need a car?

Quick answer, no. Pittsburgh's public transport works very well, and specially with a student ID that makes every single ride in Allegheny County's public transportation system free of cost. Besides the public transport, most student-dense areas are very walk-able, with grocery stores, gyms and restaurants. Even if you don't *need* a car, having one for sure is a benefit in terms of moving, getting groceries and doing trips to Costco, IKEA and Walmart. However, these locations are not out of your reach as the service [Zipcar](#) is strong in Pittsburgh and you can rent cars for only a few hours up to whole days. Alternatively you might have some leftover pizza that you can exchange for a few hours with your friend's car (amount of slices is negotiable).



Part II

Incoming Students



4

Transitioning to Graduate School

Tomas Suarez Omedas

CEO of Student Life

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If no one has said this until now, Congratulations! You deserve that and an ice cream cone because you have been accepted as a doctoral student in a world-class university. Now to the important stuff, we know that the concept itself of being a graduate student can be overwhelming but we can assure you that everything will be alright.

From this point on society expects two things from you: To be an expert in your field *and* to be a fully functioning adult, but we got you.

4.1 How to be an expert in your field

Step 1: First you have to... Just kidding. There is no set of steps that will take you from where you are to being an expert. Everyone begins as the new guy at some point. You will feel that you are the person that knows less in the room (in many rooms) and that may discourage you or make you feel small. Push through that feeling and focus on yourself and how can you improve, even if you feel small. The main way to acquire the "expert" qualities that scientists have in the humble opinion of this author is to read a lot (scientific papers and books) and speak up. If you don't understand what is happen ask for a rundown. If you are confused ask for clarification. Look for the knowledge you need, in literature and in the people around you.

4.2 How to be a functioning adult (if you don't know how)

We are still figuring out this one, but if you have any input please let the authors know and we might write it up here. The main part that we identify of being a functioning adult is to take care of oneself. Take care of you physically, mentally, financially and so on. In the CMU community, personal well-being and mental health is valued, understood and cherished.

In more specific matters, I (the all-knowing author) have four categories of things to do, and the balance between them is what keeps me going day by day. First (and most obvious), academia: Turn stuff on time, achieve milestones and learn lots from everything around me. Second, personal "logistic" stuff: Do my taxes on time, go to the doctor/dentist/optometrist often (not only on emergencies), organize my room and kitchen and so on. Third, contact with my family and friends: I maintain contact with the people I love and cherish, which involves calling/messaging them and finding time to connect with them (traveling or talking about different things than school). Last but not least, my fourth category is me: I do stuff I like and live a life that I like living. I believe that there is no way that I can push through a Ph.D without liking myself in the process.

You can make your own categories (or have none whatsoever), this is the way that this humble author found to become a resemblance of a functioning adult.

5

Insurance and Taxes

Tomas Suarez Omedas

Lord of Student Life

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“nobreak

5.1 Insurance

At the moment of this writing CMU announced that will cover 100% of the health insurance of graduate students. CMU's graduate student association (GSA) will use this win for graduate students to advertise their effectiveness to sort bureaucratic resistance (and it is well deserved).

To this moment the insurance plan through the university is called the [Student Health Insurance Plan](#) (SHIP, yes, we like acronyms) and you can check their page for a complete list of services and coverage. In general, SHIP is a very good base insurance that covers regular physical exams, many emergency services and lots of other health services. It does not include dental and eye health insurance, but for under \$150 a year the plan can be expanded to cover dental and eye care. There are also ways to use that money to get another insurance (while CMU pays the same amount), but requires contacting the administration.

Pittsburgh is an amazing city for healthcare, with many hospitals and independent practices of dentistry, ophthalmology and more. One piece of advice, schedule physical exams and dentist appointments with anticipation as appointments may only be available many months in advance.

5.2 Taxes

Taxes here are just as complicated as taxes everywhere in the US, but there are a couple perks for CMU students. First, CMU students are exempt from local and state taxes if your address in the tax return is in Pennsylvania. We still pay federal taxes like social security and medicare, but reducing the other two tax sources makes our returns much cheaper. Important note for international students: CMU offers [Glacier](#), a tax tool *free* only for CMU international students. This can help you be assured that you will not have tax problems with Uncle Sam down the road.

6

Apartments and Renting

Tomas Suarez Omedas

Senpai of Student Life

Tim Nolan

Tommy Suarez's weird sidekick

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As stated before in The Atlas, Pittsburgh is on the friendly side of the spectrum with regards to renting (or buying) places to live. While perhaps not dirt cheap, the cost of living is quite manageable on a stipend when compared to coastal cities. Peak renting timing is late April and May for the best deals in town, but it is possible to find decent deals in June and July. Most lease contracts run August 1st-July 31st, but that can vary for different places.

You're more than welcome to ignore *all* of the advice in this chapter, spare one thing: In Pittsburgh (nor anywhere, for that matter!), **NEVER sign an apartment lease sight unseen. Always, always, always book a tour – ideally in-person, but virtually works too – before locking into a year-long contract.**

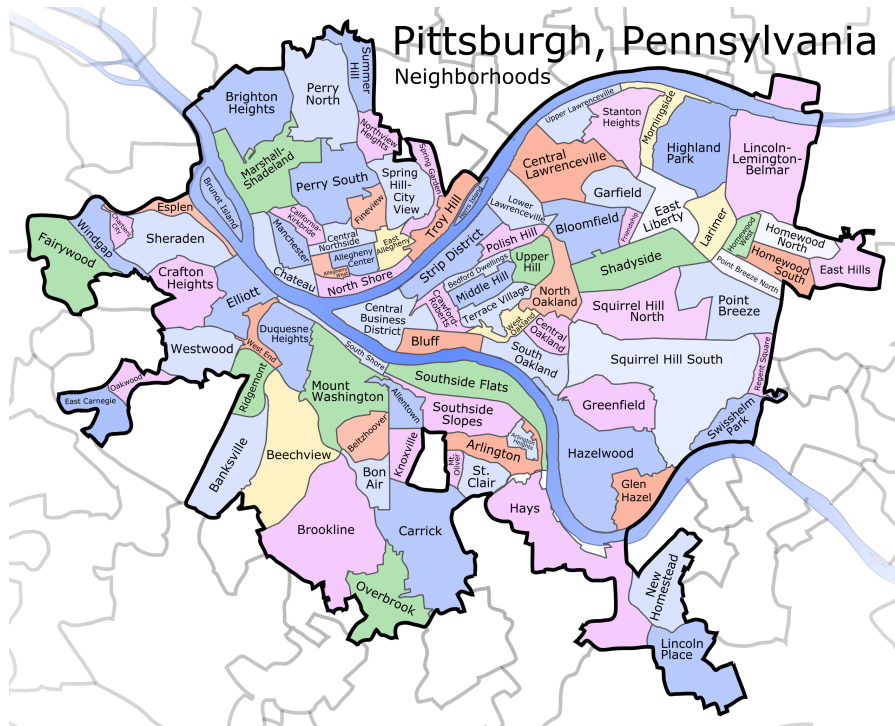
6.1 Orienting yourself in Pittsburgh

So you're moving to Pittsburgh, cool! Where should you live? Well, let's get you oriented a bit first. Pittsburgh is a city with 90 neighborhoods, each with their own pros, cons, character, and quirks. That said, perhaps only a dozen

or so neighborhoods make sense to live in with a daily commute to CMU/Pitt campus.

Pittsburgh sits at the confluence of two rivers: the Allegheny to the north, and the Monongahela (affectionately known as “the Dirty Mon”) to the south. The two join to form the Ohio river, which, if you’re a geography nerd and care, eventually flows into the Mississippi river and out of New Orleans, LA!

You will undoubtedly spend the majority of your time in Pittsburgh’s East End – the neighborhoods east of downtown and sandwiched between the Allegheny and Mon rivers. CMU demarcates the western edge of Squirrel Hill, and Pitt is immediately to its west in Central Oakland.



6.2 Where to live?

By far, the two most popular areas for CMU graduate students to live are Shadyside and Squirrel Hill. These two areas are just to the east of CMU and Pitt, and are well-connected to the universities and downtown via various

buses and main streets. We will talk about rent pricing in the next section, but here are some qualitative facts from these two areas:

- Shadyside
 - 10-20 min to campus via bus
 - Slightly younger population
 - Good amount of local bars and restaurants in the area
 - Apartment buildings as well as multi-unit houses
 - Upscale shopping on Walnut St, if that's your thing
 - Has many grocery stores, a huge Giant Eagle, a smaller Aldi, a Japanese grocery, and at the far end of Shadyside there is a Target, a smaller Giant Eagle, and a Whole Foods
 - Easy (read: flat) biking to campus, if that's your thing
 - Buses to campus: 71A-D, 75, P3 (bussing from Shadyside requires a ~5 min walk to CMU from Fifth + Morewood/Neville)
 - CMU shuttle: CMU has shuttles that run regularly from many neighborhoods (including Shadyside) directly to campus. Download the RideSystems app or go [online](#) to track the buses in real time.
- Squirrel Hill
 - 5-20 min to campus via bus
 - Many families live in the area (more quiet area)
 - Mostly multi-unit houses for rent
 - Many restaurants and some shopping in Forbes and Murray avenue (but less than in Shadyside)
 - Only has one grocery store, a very small Giant Eagle (yes, we find that funny as well) but that has all you need, although maybe not many different brands of everything
 - Downhill biking to campus, uphill on the way home
 - Buses to campus: 61A-D, 67 (all these lines drop off directly at CMU campus)
 - CMU shuttle: also has a route through Squirrel Hill

If commute time to CMU is of utmost importance to you, Squirrel Hill is tough to beat (besides perhaps North Oakland, see below). Along Forbes Ave you will find a constant stream of 61 buses that come every three or four minutes. If you prefer a bit more density (but not overwhelmingly so), a flat commute for biking, or find yourself at Pitt several times per week, Shadyside gets the edge.

Though they are the most popular, don't exclusively limit yourself to Shadyside and Squirrel Hill during your apartment hunt! Here's a nonexhaustive list of other areas to consider, roughly ordered by commute time to CMU.

- North Oakland
 - Is very close (read: walkable) to CMU and Pitt main campus, especially Mellon Institute where many neuroscience research labs and classes are located
 - The undergraduate population is more dense
 - Good restaurants and bars nearby
 - Almost exclusively apartment buildings, with fewer multi-unit houses
 - Its “prime” location makes it more pricey
- Central/South Oakland
 - At the very foot of Pitt campus, short walk to CMU
 - Very dense, almost exclusively consists of Pitt undergrads and the NISO president
 - Affordability can't be beat
- South Side
 - More urban than Shadyside and Squirrel Hill
 - Center of Pittsburgh night life, make of that what you will
 - Bus lines: 54, 75
- Bloomfield/Friendship
 - More urban than Shadyside and Squirrel Hill
 - Less connected to campus than Shadyside. Bus lines: 54, 71A, 71C
- East Liberty/Highland Park
 - E. Lib is more urban than Shadyside and Squirrel Hill; Highland Park is very similar to Squirrel Hill
 - Walking distance to Target and some good food and drinks
 - Bus lines: 71A-C, 75
- Lawrenceville
 - Trendiest neighborhood in town
 - Bus lines: 54, 93
- Point Breeze/Regent Square

- Basically just Squirrel Hill continued, but further east.
- Less connected to campus. Bus lines: 67
- Regent Square is no longer a highly recommended option with the collapse of the Fern Hollow bridge, which ruined 61A and B service

Disclaimer: I want to reiterate that this list is *not exhaustive*, and omission of a neighborhood does not imply you should not live there. If you have questions about a neighborhood, feel free to email the authors.

6.3 Renting

The renting process can be stressful, with many pitfalls. For many, graduate school will be the first time you're not living at home or in on-campus housing. Here's what to expect and our tips for navigating the Pittsburgh rental market.

6.3.1 How much should I budget?

Most graduate students (at least at the beginning) rent single rooms in multi-unit houses or apartment buildings, so let's begin there. For a *complete* shared living space (i.e., full room with closets, a bathroom [shared or single], and decent-sized kitchen space), single room rents range from \$600 to \$1200 plus utilities. These are estimations and we recommend to check [Apartments.com](#) and such for a more exact and current information. We know there are people who like to save by living in basements, closets and such (we respect you, you are valid) and those rents can be found for \$300-\$500, however we do not recommend them for your mental health.

One-bedrooms apartments can be found in the areas mentioned above at around \$850 to \$1,400. They have the advantage of more privacy at a little higher expense, but unlike bigger cities it is not impossible to rent one-bedrooms.

Be mindful of what utilities you have to pay. Generally, it's some subset of Gas, Electric, Internet, Garbage, and Water, with the landlord taking the rest. Depending on your situation, budget approximately \$0 to \$200 for utilities.

6.3.2 How do I find a place?

There is no surefire answer to this question. For best success, the solution is to do a daily comb of Facebook Marketplace, CMU and Pitt FB housing groups, Apartments.com, Zillow.com, and Craigslist.com. When you see a listing you're interested in, reach out for a tour immediately, as there are literally tens of thousands of other students between CMU and Pitt looking for places, too!

6.3.3 Roommates?

Finding potential roommates can be done through the [CMU roommate finder website](#). As there is no graduate campus housing, there are always a good amount of students with and without places to find roommates.

Depending on the landlord, there might be a principal lease where one of the roommates subleases each room to other people, but it is also common to have direct single bedroom leases to avoid complications with the primary lease holder.

6.3.4 Pittsburgh slumlords

Pittsburgh, like many cities, has good and bad landlords (well, “good” is a debatable term for anyone who profits off the fundamental human need for shelter, but I digress...). Avoid the following notorious names, or at bare minimum proceed with caution if you want to live in an apartment owned by one:

- Lobos Management
- Nexus
- E&J Management
- McKee Place
- Ross Sindler
- Kathryn Kukla / Tranquilily LLC
- Claridge Apartments

7

Classes and Program Requirements

Tomas Suarez Omedas

Knight of Student Life

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The full list of courses for each program can be found online [here \(PSN\)](#) or [here \(PNC\)](#), but we'll go over class recommendations, remarks and more. Don't forget to ask other students about their experience with these courses.

7.1 First Year Classes

Both PSN and PNC programs have very similar class requirements, and thanks to the program founders we only have to take a few classes, allowing time for research. In a quick summary, we recommend to take first Advanced Cellular Neuroscience for everyone in their first year and either an elective or Cognitive Neuroscience to tackle CNBC core-course requirements. If you have an elective that are very excited to take and believe it will most likely benefit your current research trajectory, we encourage you to take it. If there aren't any electives that are in your scopes, the wisest option is to save them for when you identify the ones that are going to help you in your research.

7.2 CNBC Requirements

The CNBC required courses are four in total: Advanced Cellular Neuro, Systems Neuro, Cognitive Neuro and Statistical Models of the Brain. We recom-

mend to take them all within the first four semesters, either one or two each semester as these are key base neuroscience courses. The cornerstone of these classes is reading several primary literature publications. The main benefit from this classes is to make you into a neuroscientist in training regardless of your background and put you up to speed with past and current methods and hot topics in the field.

7.3 Electives

The list of electives in PSN and PNC programs has some overlap and we are required to take two-three electives total. In the PSN there is a longer elective list and the PNC has a "stratified" list of electives with different groups of them. Use your best judgement and take the electives that will help you and your research, as you have now the chance of acquiring very direct knowledge from great professionals in the field. Don't hesitate to ask students of other cohorts and the authors of this Atlas to tell you their experience about their electives. If after you take your electives there are more classes you would like to attend, you can always audit/observe the class without taking it for a grade.

The requirements of both electives and additional courses for each of the programs are slightly different, so let's go over them one at a time

- PNC: Students in the PNC are required to take a total of three additional courses: one computational neuroscience methods and two quantitative methods. Each course can be chosen from a pool specified in the [PNC curriculum page](#). IMPORTANT: the course 36-705 Intermediate Statistics is strongly discouraged for both PSN and PNC students. Is a course on the statistics that provides basis to machine learning methods but is not a class of machine learning itself with a very intense curriculum and high attrition rate.
- PSN: The PSN has one additional course 36-749 Experimental Design. This course is meant to catch up to speed students with little background in math and statistics used in experimental work and analysis. If you have background in these areas it might be a redundant class and talk with the program director or students from previous cohorts for more advise. PSN students also need to take two semesters of two different seminar series: the Bio department seminar series and the Bio student seminars, no exams done in these classes but attendance may be mandatory and taken every week. Finally, there is a Proposal Preparation course that no one in the PSN has taken yet as they are just beginning, but it'll be updated here as soon as the PSN students grow up.

8

Research and Professors

Tomas Suarez Omedas

Prince of Student Life

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Find a simple breakdown of research areas available to any student in the NI.
Disclaimer: This is subjective and bound to change over time, let the authors know if there are relevant information that this list does not cover

8.1 Faculty by Research Area

Right to the point, simple list by areas. Professors might be listed more than once

Sensory Systems	Motor Systems	Computational	Disease	BCI	Other
Vision Raj Ghandi Carl Olson Matt Smith Mike Tarr			Parkinson's Jon Rubin Eric Yttri Aryn Gittis		
Somatosensory Kate Hong Eric Yttri Alison Barth	Basal Ganglia Raj Ghandi Carl Olson Matt Smith Mike Tarr	Byron Yu Steve Chase Pulkit Grover Maysam Chamanzar William Stauffer Rob Kass Chengcheng Huang Jon Rubin Bard Ermentrout Mike Tarr	Schizophrenia Tobias Teichert Ross Williamson	Rob Gaunt Steve Chase Doug Weber Aaron Batista Bin He Takashi D.Y. Kozai Maysam Chamanzar Marco Capagrosso Jen Collinger Elvira Pirondini	Andreas Pfenning John Paul Shen Rajkumar Kubendran Wayne Wu Hartmut Geyer
Audition Ross Williamson Barb Shinn-Cunningham Caroline Runyan Michelle Insanally Tobias Teichert Aravind Parthasarathy	Sensorymotor Steve Chase Aaron Batista		Stroke Doug Weber Kate Hong RNEL		

