

Cognitive Science Program Orientation

<https://bbs.utdallas.edu/degrees/cgs/>



**Cognitive Science
Program Head:**
Professor Richard Golden



**BBS Director of
Undergraduate Advising:**
Leah Barfield



THE UNIVERSITY OF TEXAS AT DALLAS

School of Behavioral and Brain Sciences

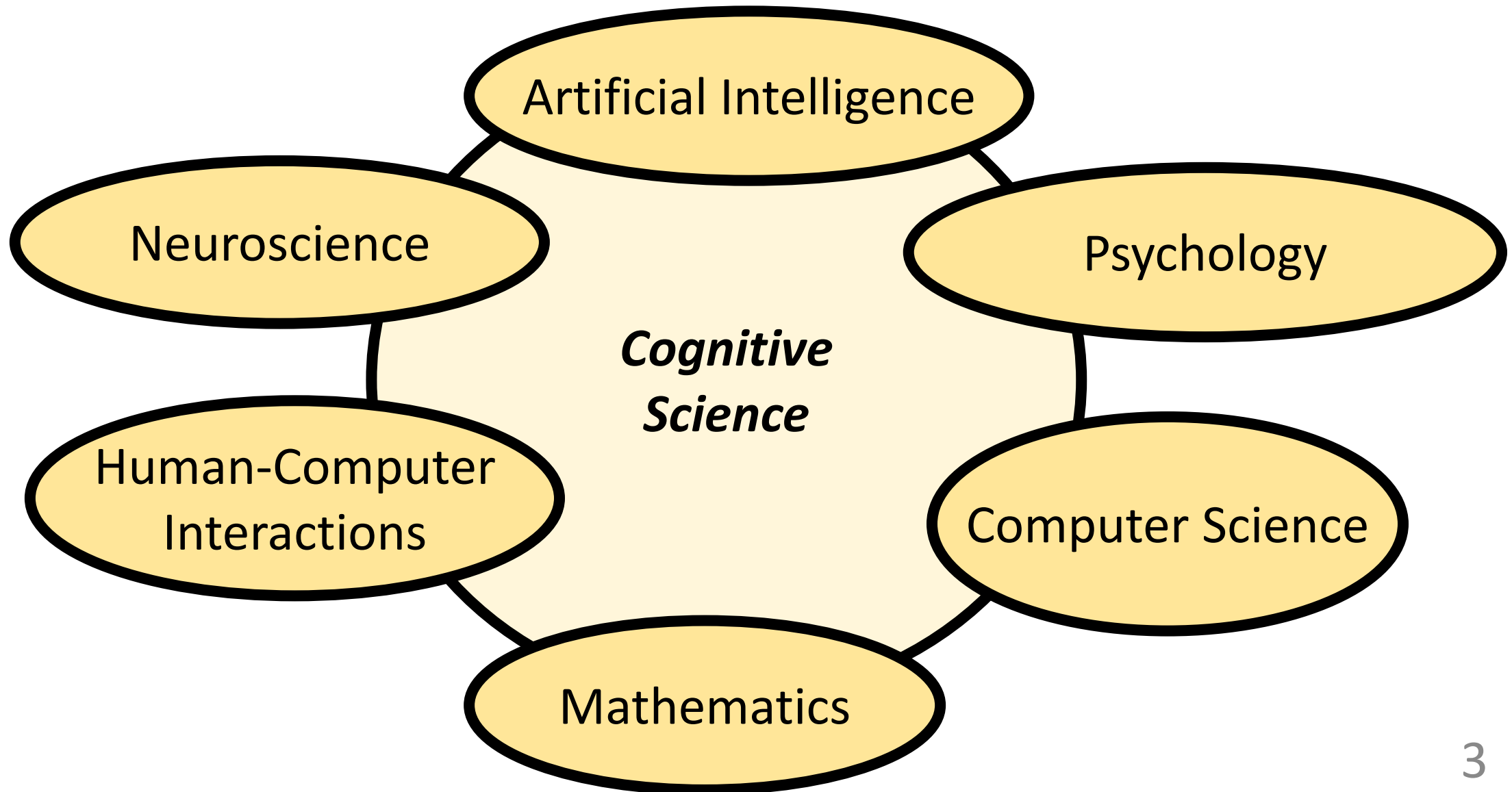


The Cognitive Science Program is very excited that you have chosen to pursue your undergraduate studies in this area with us!

Our goal is to not only maximize your learning experience but also prepare you to pursue new career directions once you graduate!

In addition, we will do our best to make this process fun and enjoyable!!

Cognitive Science: The Multidisciplinary Study of Intelligent Systems



Overview of UTD Cognitive Science Program

- Emphasizes novel integrations of neuroscience, psychology, computer science, and human-centered design

Overview of UTD Cognitive Science Program

- Emphasizes novel integrations of neuroscience, psychology, computer science, and human-centered design
- Understanding the Brain and Mind Requires Multidisciplinary View!

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Psychology



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Psychology



Neuroscience

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Psychology



Human-Computer Interactions



Neuroscience



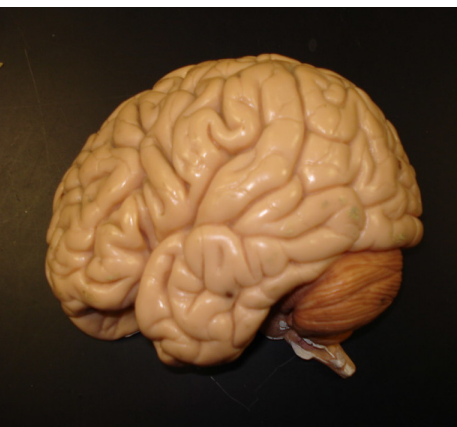
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Psychology



Human-Computer Interactions



Neuroscience



Machine Learning

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Psychology



Human-Computer Interactions



Premed and Health Services



Neuroscience



Machine Learning



Concentration Areas: (Select 2 of 3 Areas)

1) Psychology/Human-Computer Interaction



2) Neuroscience



3) Artificial Intelligence & Computational Modeling



Equivalently group by Concentration Area Pairs

(Choose 1 pair):

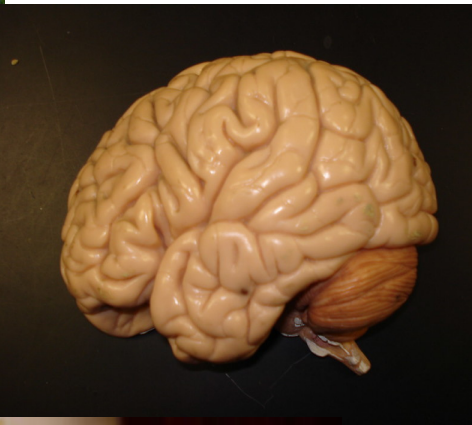
- Psychology/Human-Computer Interaction
- Neuroscience

- Artificial Intelligence & Computational Modeling
- Neuroscience

- Psychology/Human-Computer Interaction
- Artificial Intelligence & Computational Modeling

Concentration Areas

- Psychology/Human-Computer Interaction
- Neuroscience



Career Paths

Psychologist

Neuroscientist

Neuropsychologist

Cognitive-Neuroscientist

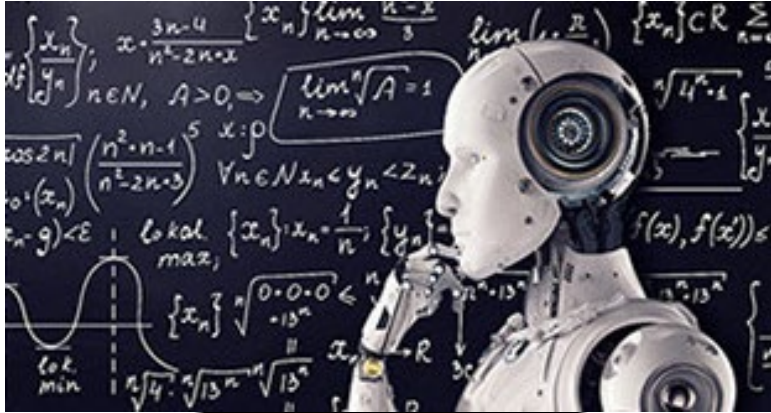
Premed/Health Services

Neuropharmacology

Usability Engineer

User Experience (UX) Engineer

Concentration Areas



- Artificial Intelligence & Computational Modeling
- Neuroscience



Career Paths

Neuroscientist

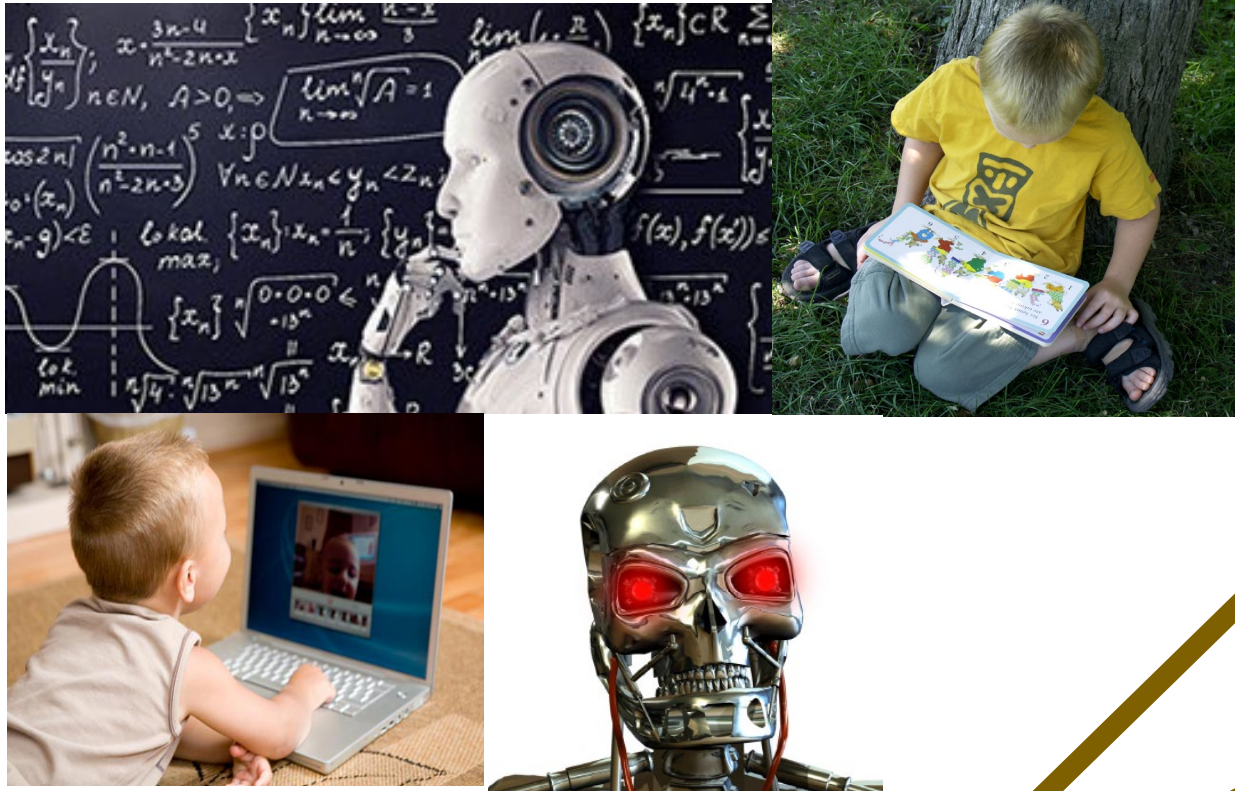
Data Scientist

Data Scientist Analyst

Machine Learning Engineer

Computational Neuroscientist

Concentration Areas



- **Psychology/Human-Computer Interaction**
- **Artificial Intelligence & Computational Modeling**

Career Paths

Psychologist

Data Scientist

Data Scientist Analyst

Machine Learning Engineer

Usability Engineer

User Experience (UX) Engineer

Mathematical Psychologist

Learn More about a Potential Career Path By Visiting **Wikipedia**!

2/19/2021

Data science - Wikipedia

WIKIPEDIA

Data science

Data science is an inter-disciplinary field that uses scientific methods, processes, algorithms and systems to extract knowledge and insights from many structural and unstructured data.^{[1][2]} Data science is related to data mining, machine learning and big data.

2/19/2021

Usability engineering - Wikipedia

WIKIPEDIA

Usability engineering

Usability engineering is a field that is concerned generally with human-computer interaction and specifically with devising human-computer interfaces that have high usability or user friendliness. It provides structured methods for achieving efficiency and elegance in interface design.^[1]

Several broad disciplines including Psychology, Human Factors and Cognitive Science subsume usability engineering, but the theoretical foundations of the field come from more specific domains: human

2/19/2021

Neuropsychology - Wikipedia

WIKIPEDIA

Neuropsychology

Neuropsychology is a branch of psychology that is concerned with how the brain and the rest of the nervous system influence a person's cognition and behaviors. More importantly, professionals in this branch of psychology often focus on how injuries or illnesses of the brain affect cognitive functions and behaviors.

It is both an experimental and clinical field of psychology that aims to understand how behavior and cognition are influenced by brain functioning and is concerned with the diagnosis and treatment of

Learn More about Potential Career Paths By Visiting “Indeed.com”



Jr. Machine Learning Engineers

Enhance IT 3.1
Nashville, TN

\$35 - \$40 an hour

Easily apply Urgently hiring

- Ability to translate objectives to a project plan with milestones, and resource/technology requirements, and teach, lead, and manage projects/people/clients...

14 days ago · [Save job](#)

new

Data Scientist

United Medical Credit
Remote

\$105,000 - \$125,000 a year

Easily apply Urgently hiring

- Develop set processes for data mining, data modeling, and data production that will create data narratives around insights identification, trends, and business...

Neuropsychologist

St. Elizabeth Physicians 3.3
Crestview Hills, KY 41017

\$40 - \$48 an hour

Easily apply

- Evaluates and (where appropriate) accepts referrals from St. Elizabeth and community sources for assessment in the areas of cognitive, psychological, and/or...

30+ days ago · [Save job](#)

Neuropsychologist

Justin Lo MD
San Jose, CA 95128 (Rose Garden area) ·

Temporarily remote

\$70,000 - \$100,000 a year

Easily apply Responsive employer

- Conduct neuropsychological evaluations such as assessments of intelligence, academic ability, attention, concentration, sensorimotor function, language,...

24 days ago · [Save job](#)

new

Solutions Engineer

Holland & Hart LLP 3.8
Boulder, CO 80302 (Whittier area)

\$51,000 - \$84,000 a year

- Diagnose and solve technical and usability problems while maintaining a clear awareness and genuine appreciation of challenges facing non-technical users...

7 days ago · [Save job](#)

Application Engineer

Appian Corporation 3.5
McLean, VA

Easily apply

- Proactively provide feedback to Appian's Engineering team and participate in usability testing for new product features.

30+ days ago · [Save job](#)

UX/UI Designer

Goji Labs
Remote

\$70,000 - \$85,000 a year

Easily apply Urgently hiring

- Familiarity with programming languages and experience working with engineers is a plus.
- Plan and conduct user research, including user interviews, usability...

Cognitive Science Major at UTD

(Major Core Coursework)

- CGS 3361 Cognitive Psychology :
Experimental behavioral methods for testing models and theories of human information processing.

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- NSC 3361 Neuroscience:
The structure and function of the brain and its relationship to the mind.

Cognitive Science Major at UTD

(Major Core Coursework)

- CGS 3361 Cognitive Psychology :
Experimental behavioral methods for testing models and theories of human information processing.
- NSC 3361 Neuroscience:
The structure and function of the brain and its relationship to the mind.
- PSY 3392 Research Design and Analysis:
Design of experiments and data analysis methodologies.

Cognitive Science Major at UTD

(Major Core Coursework)

- CGS 3361 Cognitive Psychology :
Experimental behavioral methods for testing models and theories of human information processing.
- NSC 3361 Neuroscience:
The structure and function of the brain and its relationship to the mind.
- PSY 3392 Research Design and Analysis:
Design of experiments and data analysis methodologies.
- PSY 3393/CGS 3340 Experimental Projects:
Projects involving experimental design, data analysis, and scientific writing.

Psychology Concentration Area

Major Preparatory Lower-Division Coursework

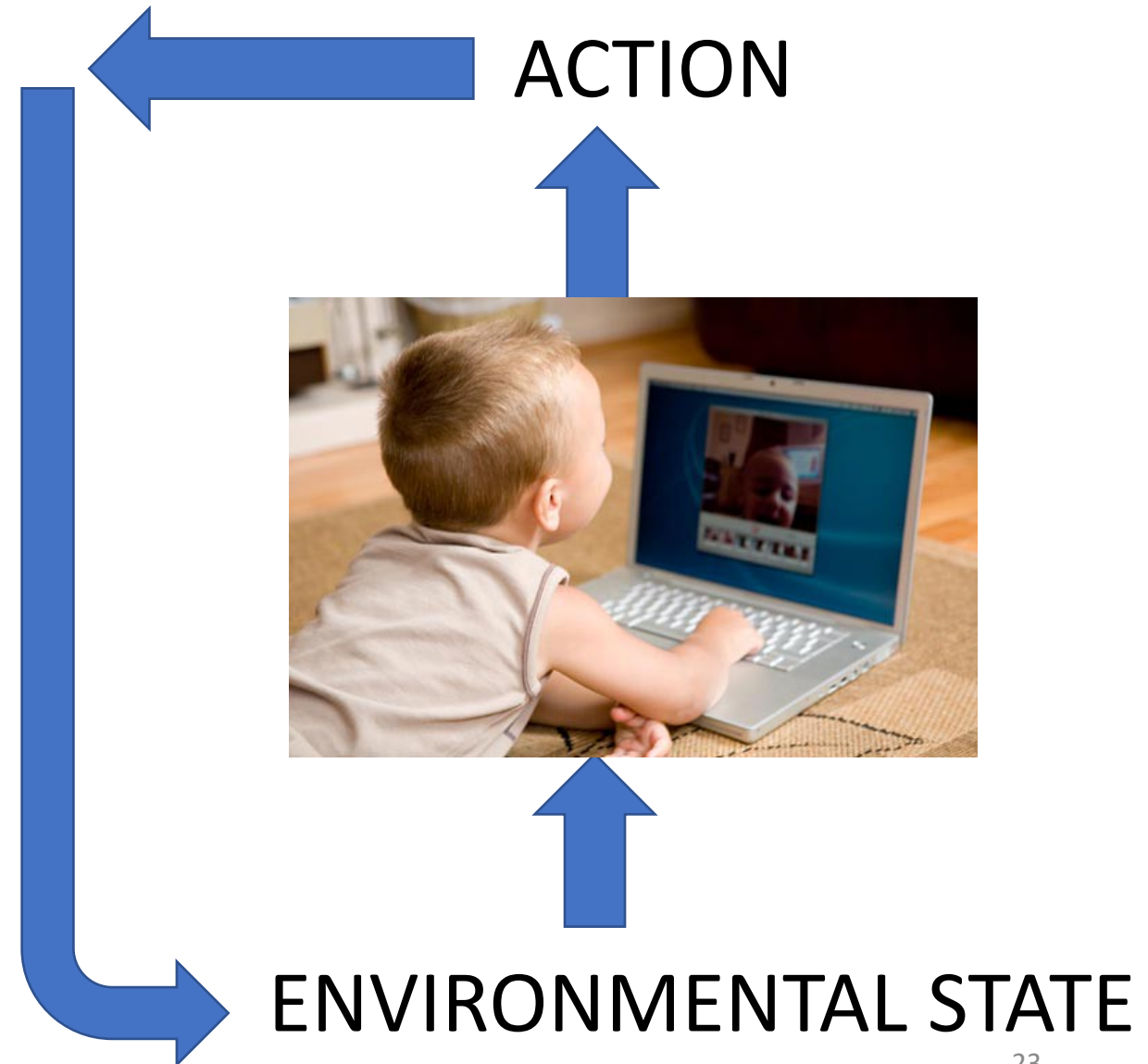
- CGS 2301 (Cognitive Science)
- Math 2417 (Calculus 1) or Math 2413
- Math 2419 (Calculus 2) or Math 2414
- CS 1337 (Computer Science 1)
- Math 2418 (Linear Algebra)
- Psy 2301 (Introduction to Psychology)
- Psy 2317 (Statistics for Psychology)



Psychology/HCI Concentration Area

Concentration Area Coursework (Choose 4 of the following)

- Historical Perspectives
- Cognitive Neuroscience
- Perception
- Social Psychology
- Child Development
- Cognitive Development
- Attention and Memory
- Neuropsychology
- Psychology of Reasoning
- **Human Computer Interaction 1**
- **Human Computer Interaction 2**

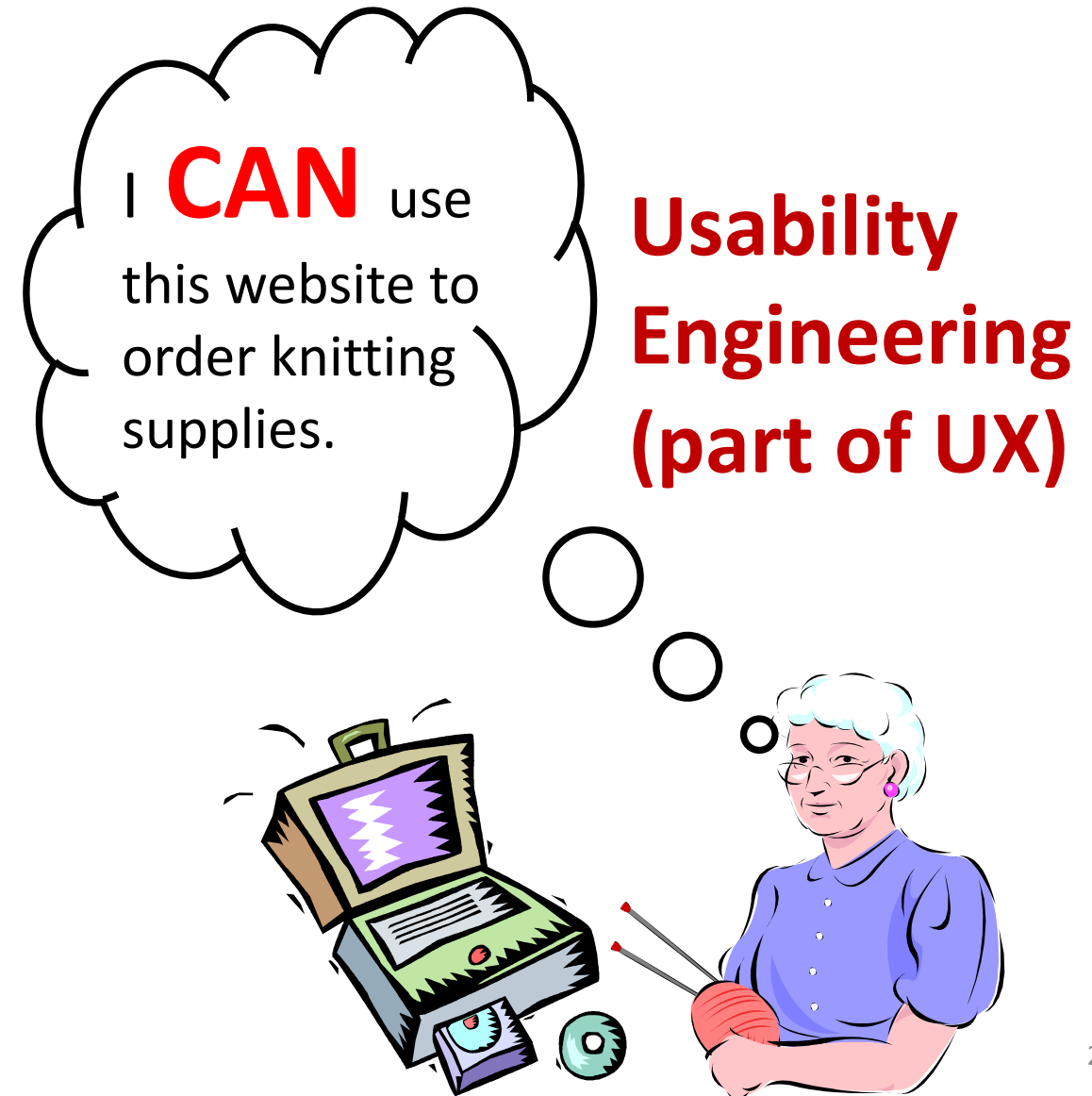


Human-Computer Interaction Specialization Area (Usability Engineering)

What is Usability Engineering?

Usability engineering is a field that is concerned generally with human-computer interaction and specifically developing human-computer interfaces that have high **usability** or user friendliness.

Usability engineering uses behavioral science research methodologies to evaluate how specific subpopulations interact with technology (e.g., websites, smart phones, voice user interface systems).



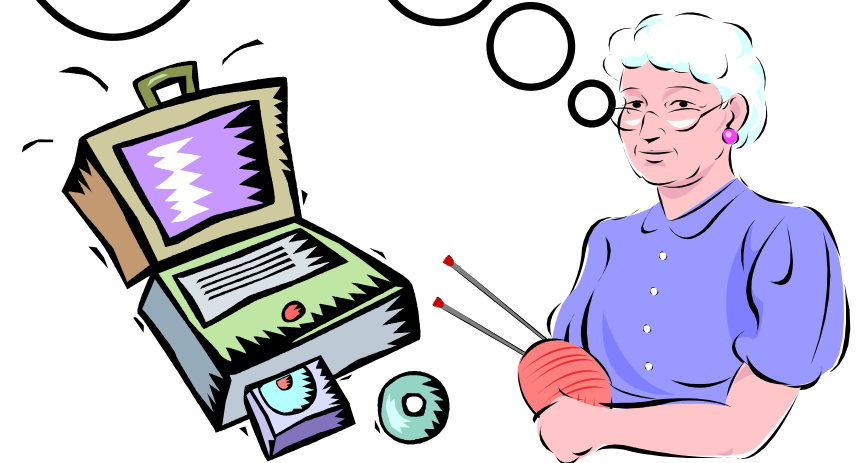
Human-Computer Interaction Specialization Area (User Experience (UX))

What is User Experience (UX)?

- Usability Engineering
- Has Functional Value
- Has Aesthetic Value

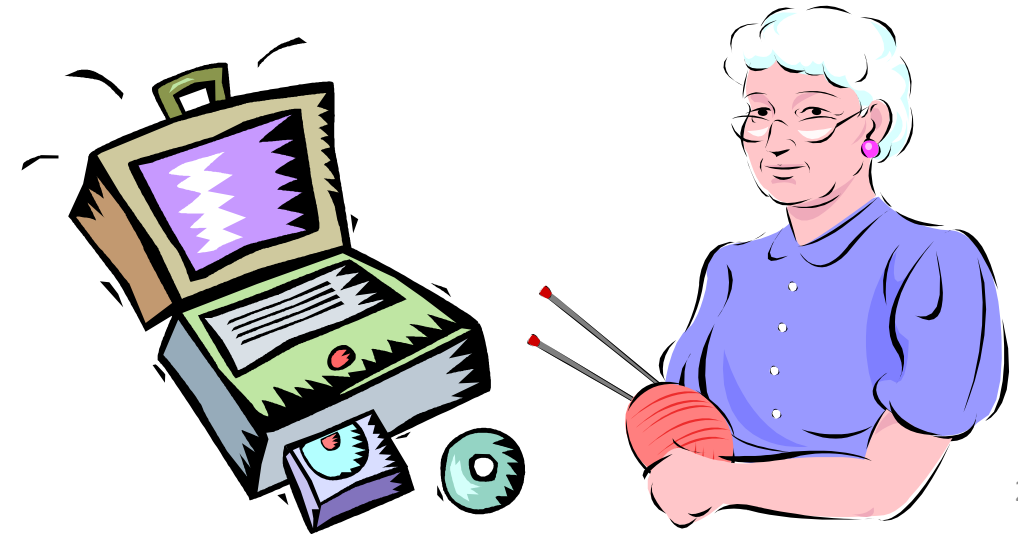
I **LOVE** using
this website to
order knitting
supplies!!!
**Its so much
FUN!!!!!!**

**User
Experience
(UX)**



More Usability Engineering and UX Resources!

Resources for learning more about HCI:
<https://www.usabilitysciences.com/blog>
<https://jnd.org/>
<https://www.nngroup.com/>
<https://bigdesignevents.com/>



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UTD UX Club

Big Design Conference (Every Fall)

Note: Usability Engineering does not necessarily require advanced software development skills but you must be able to interface with software developers. Familiarity with HTML and CSS a definite plus!!!

Note: UX positions may require both Usability Engineering skills AND additional skills like software development, artistic design, or managerial skills.

Neuroscience Concentration Area

Major Preparatory Lower-Division Coursework

- CGS 2301 (Cognitive Science)
- Math 2417 (Calculus 1) or Math 2413
- Math 2419 (Calculus 2) or Math 2414
- CS 1337 (Computer Science 1)
- Math 2418 (Linear Algebra)
- Psy 2301 (Introduction to Psychology)
- Psy 2317 (Statistics for Psychology)
- **Biol 2111 Introduction to Modern Biology Workshop 1**
- **Biol 2281 Introductory Biology Lab**
- **Biol 2311 Introduction to Modern Biology 1**
- **Chem 1311 General Chemistry 1**
- **Chem 1112 General Chemistry Lab 2**
- **Chem 1312 General Chemistry 2**



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<https://www.flickr.com/photos/biologycorner/4018079840/in/photostream/>

Neuroscience Concentration Area

Concentration Area Coursework (Choose 4 of the following)

- Cellular Neuroscience
- Integrative Neuroscience
- Neurophysiology
- Neuroanatomy
- Neuropharmacology
- Development Neurobiology
- Cognitive Neuroscience
- Neuroscience Lab Methods
- Neuropsychology
- Molecular Neuroscience
- Medical Neuropathology
- Neuroimmunology

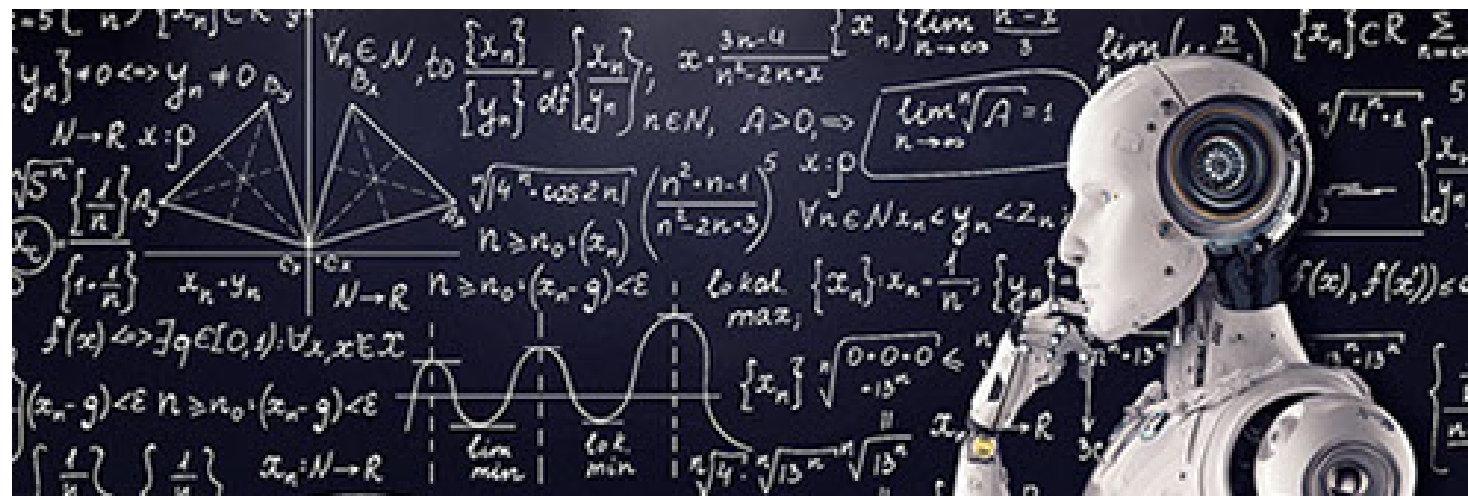


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Computational Modeling/Artificial Intelligence Specialization Area

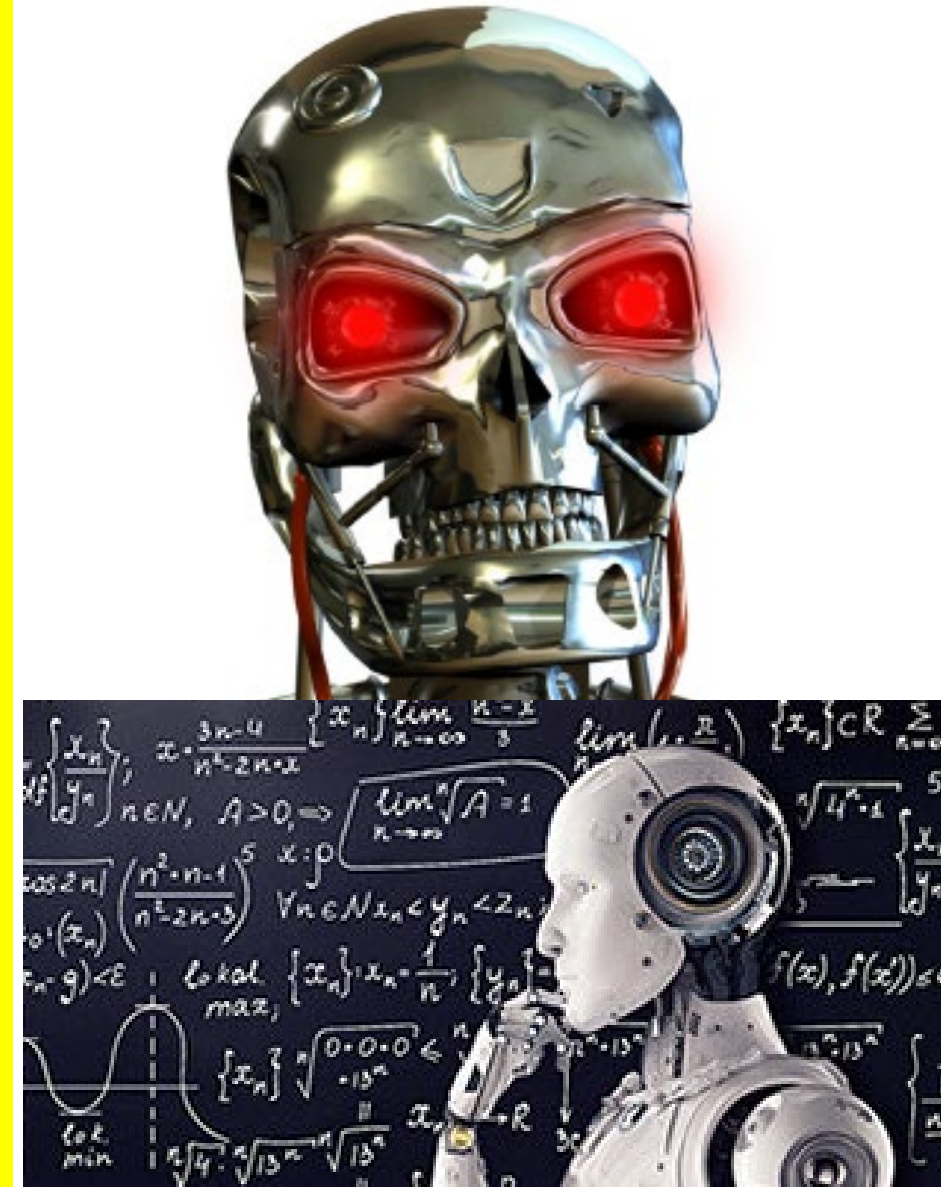
Computational Modeling/Artificial Intelligence

Implement “Smart”
Algorithms using
Machine Learning Software
Development Environments.



Computational Modeling/Artificial Intelligence

- Use Machine Learning Algorithms to Analyze Cognitive-Neuroscience Data
- Develop and Evaluate Machine Learning Algorithms as Behavioral or Neural Information Processing Models



Computational Modeling and Artificial Intelligence Specialization Area

In order to have a successful career in this area you MUST have strong computer programming skills and familiarity with one or more machine learning development languages. For more details: <https://www.learningmachines101.com/lm101-078-ch0-how-to-become-a-machine-learning-expert/>



Computational Modeling and Artificial Intelligence Concentration Area

Major Preparatory Lower-Division Coursework

- CGS 2301 (Cognitive Science)
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- CS 1337 (Computer Science 1)
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- Psy 2301 (Introduction to Psychology)
- ~~Psy 2317 (Statistics for Psychology)~~
- **CS 2305 Discrete Math for Computing 1**
- **CS 2336 Computer Science 2**



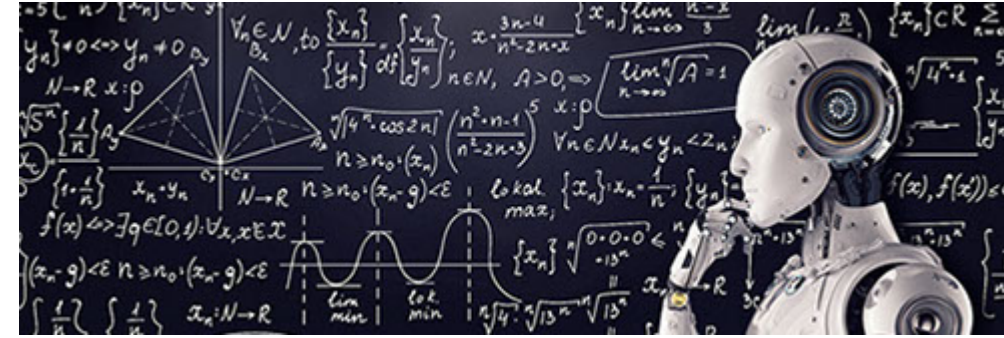
Important Note:

Contact your CGS Advisor to Sign up for CS courses which are Required for your Major with the same priority as CS students because CS students can fill up CS courses quickly!!!

Computational Modeling and Artificial Intelligence

Concentration Area

Concentration Area Coursework (Choose 4 of the following)



- CS 3341 Probability and Statistics in Computer Science
- CGS 3342 Cognitive and Neural Modeling Lab
(Introduction to Machine Learning)
- CGS 4314 Intelligent Systems Analysis
(Advanced Machine Learning 1)
- CGS 4315 Intelligent Systems Design
(Advanced Machine Learning 2)
- CS 3345 Data Structures and Introduction to Algorithmic Analysis
- CS 4365 Artificial Intelligence
- CS 4375 Introduction to Machine Learning

Important Notes:

- 1) Watch Prerequisites!
- 2) **Some courses only offered every other year!**
- 3) Contact your CGS Advisor to Sign up for required CS courses with same priority as CS students

Fast-Track to a Masters Degree in Applied Cognition and Neuroscience (ACN)

- If you are a Junior with a good GPA and sufficient number of credit hours, then you can take graduate courses and have them count towards your undergraduate degree.
- This is typically done by applying to the “Fast-Track Program”.
- As a “Fast-Track” student, you can take up to 5 graduate courses and have them count towards your undergraduate degree.
- In addition, if you decide to pursue your Master’s Degree after you complete your Bachelor’s degree and you are a fast-track student, then you are automatically accepted into the Master’s program and the number of required course credits to obtain a Master’s degree is reduced by the number of graduate course credits completed as an undergraduate student.
- To learn more about the ACN Masters Degree, check out the ACN Orientation Powerpoint and Video!!!

<https://bbs.utdallas.edu/files/ACN-2020-orientationV4-Nov2020.pdf>

Research Internships

Working in a Research Lab provides you an opportunity to interact more closely with faculty members and acquire research experiences.

This is important if you are considering a career in research because it helps you discover what aspects of research you may (or may not) like.

It may also be useful for obtaining letters of reference which are important for entering graduate schools.

Also some graduate schools would like students applying to their programs to have some research experience.

How **NOT** to Seek out an Internship or Research Opportunity.

“Hi. Do you have any internships available?”

How **NOT** to Seek out an Internship or Research Opportunity.

~~“Hi. Do you have any internships available?”~~

How to Seek Out an Internship/Research Opportunity

Hello. My name is _____. I am currently an undergraduate student in the Cognitive Science program at the University of Texas at Dallas. I noticed that you were doing research in the area of _____. I am very interested in _____ and was wondering if I could set up a 20 minute meeting with you to learn more about what type of work you are doing in this area?

How to Seek Out an Internship/Research Opportunity

Hello. My name is _____. I am currently an undergraduate in the Cognitive Science program at the University of Texas at Dallas. I noticed that you were doing research in the area of _____. I am very interested in _____ and was wondering if I could set up a 20 minute meeting with you to learn more about what type of work you are doing in this area?

During the meeting, try to figure out how you might assist in the work they are doing (If you think it is interesting).

How to Seek Out an Internship/Research Opportunity

Hello. My name is _____. I am currently an undergraduate student in the Cognitive Science program at the University of Texas at Dallas. I noticed that you were doing research in the area of _____. I am very interested in _____ and was wondering if I could set up a 20 minute meeting with you to learn more about what type of work you are doing in this area?

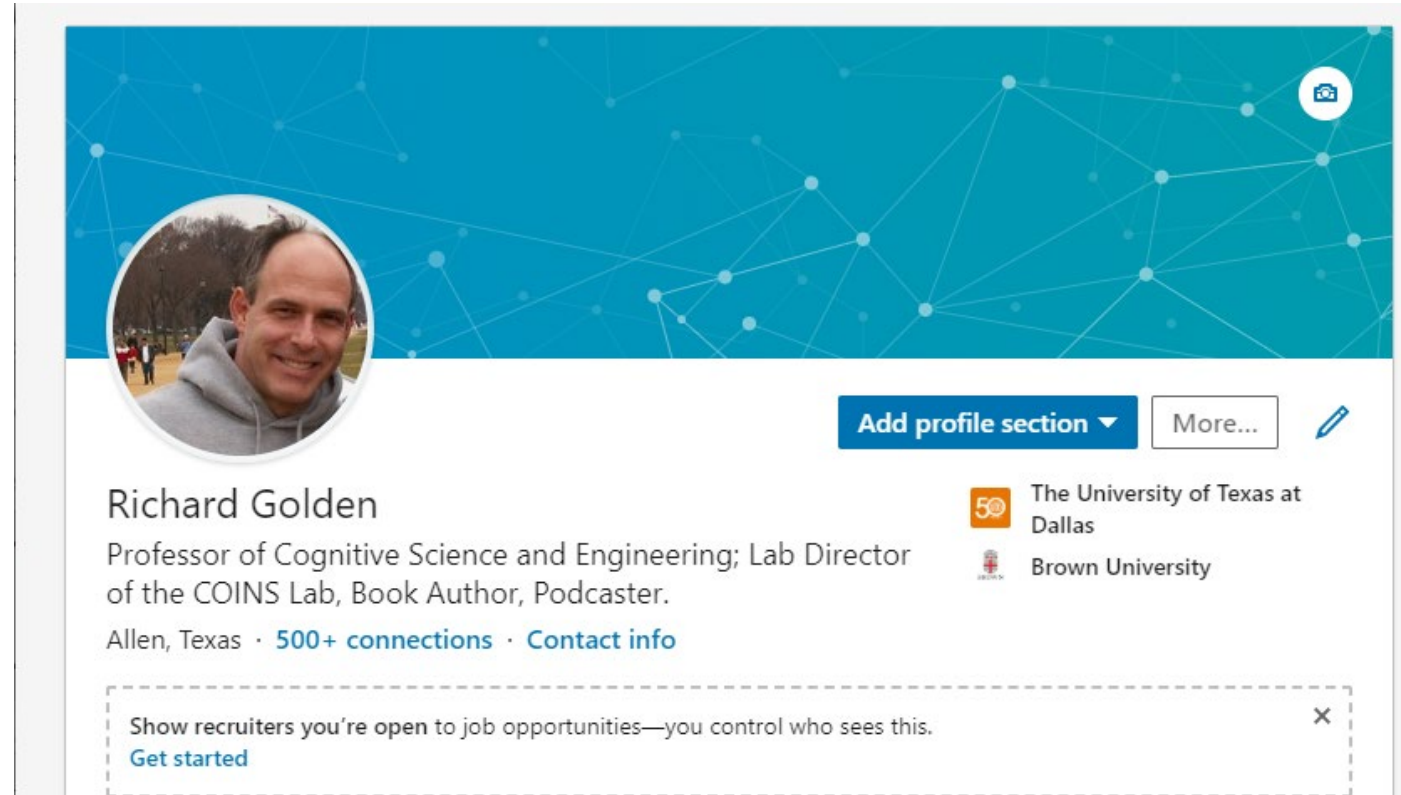
During the meeting, try to figure out how you might assist in the work they are doing (If you think it is interesting).

At the end of the meeting say:

“Thank you for meeting with me. I really enjoyed the meeting and was particularly interested in _____. Would it be possible for me to participate as a member of your lab or research group working in the area of _____?”

NETWORK using LINKED-IN

- Connect with “Richard Golden” on LINKED-IN
- This is a good way to network with other alumni of the Cognitive Science program
- Aggressively explore career opportunities BEFORE you graduate!!!



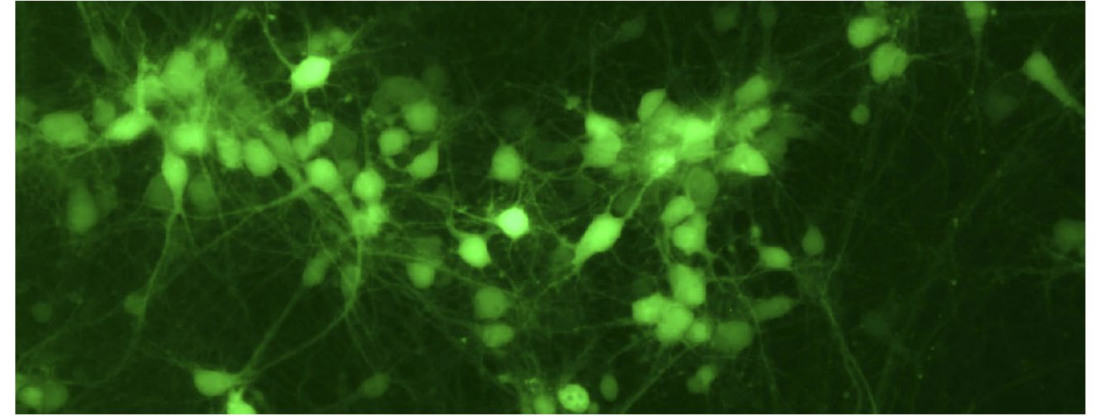
Undergraduate Advising Office Information

<https://bbs.utdallas.edu/advising-resources/>

2/24/2021 UNDERGRADUATE ACADEMIC ADVISING RESOURCES - School of Behavioral and Brain Sciences - The University of Texas at Dallas



The University of Texas at Dallas
School of Behavioral and Brain Sciences



UNDERGRADUATE ACADEMIC ADVISING RESOURCES

When Must I See my Advisor?

- Any freshman with fewer than 30 credits completed must see an advisor prior to registration for classes.
- New transfer students must attend [transfer orientation](#) prior to registration.
- Students with an [account hold](#) must see an advisor to register for courses.
- Students who are experiencing registration issues should see an advisor for assistance (e.g., prerequisite issues, transfer credit, etc).
- Students intending to graduate must complete a graduation audit with an advisor prior to being permitted to complete the [online graduation application](#). Deadlines to file an audit and apply can be found on the [Academic Calendar](#).
- Students who wish to apply [AP](#), [IB](#), or [CLEP](#) credits.
- Students who wish to take courses off-campus must meet with an advisor to seek approval prior to registration off-campus.

How to Submit Registration Requests

Send a request to bbsadvising@utdallas.edu with the following information:

- Five digit class number (e.g., 81234)
- Course Prefix (e.g., PSY)
- Course Number (e.g., 2301)
- Section Number: (e.g., 001)

Please note, email will be answered as second priority to in-person students. Urgent registration requests should be addressed in person in the Advising Office.

It is the student's responsibility to check that the correct course is added to their schedule and to follow-up that the course is appropriate for their degree plan and graduation requirements.



Thank you for your Attention!

We are here to help you succeed!!



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