Artificial Intelligence

This track examines methods and techniques for designing machinery that can reason and think the way humans do. Topics include problem solving, game playing, natural language understanding, agents, expert systems, logic programming, neural networks, robotics, automated theorem proving, and machine learning.

Courses:

CS 380 Artificial Intelligence
CS 481 Advanced Artificial Intelligence
CS 485 (Topics in Artificial Intelligence) –
  -Robot Lab
  -Evolutionary Computing
  -Biologically Inspired Agents
  -Search Techniques

Track Advisors:

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Computer Vision and Graphics are interrelated disciplines that strive to make computers see and recreate the complex world that surrounds us. Capturing, modeling, and rendering visual information requires robust algorithms based on a rigorous understanding of the physical world. This track covers the fundamental theory and applications that will prepare you for exciting careers and further studies in such fields as security, medical imaging, multimedia, computer-aided design and entertainment.

Courses:

CS 338 Graphical User Interfaces
CS 430 Computer Graphics
CS 431 Advanced Rendering Techniques
CS 432 Interactive Computer Graphics
CS 435 Computational Photography
Computer and Network Security

This track focuses on issues affecting the security of computer systems and networks. The courses comprising this track are used to demonstrate the principles of layered defense, attack detection and response, and comparing the cost versus the benefits of security measures in addition to providing the underlying cryptographic foundations. A security-lab course is part of this track and is used to provide hands-on experience developing secure systems.

Courses:
- CS 472 Computer Networks
- CS 475 Computer and Network Security
- CS 303 Alg Number Theory & Cryptography
In all areas of application the proper choice of data structures and algorithms is key to creating correct and efficient software. This track shows how to design algorithmic solutions for typical problems, how to analyze the use of computational resources, and where the limits of computation are. The track provides an excellent foundation for graduate study.

**Courses:**
- CS 457  Data Structures & Algorithms I
- CS 458  Data Structures & Algorithms II
- CS 440  Theory of Computation

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Game Design and Development is a multidisciplinary program jointly developed by the Computer Science Department and the Digital Media Program at Drexel University. This track covers courses on fundamentals of game design and development including 2D and 3D games and topics ranging from games for education and experimental games to large-scale commercial game development. This track will prepare students for an exciting careers and further studies in such areas as game design and development and other forms of interactive entertainments.

**Courses:**

- DIGM 260 Introduction to Computer Games
- CS/DIMG 345 Computer Game Development
- CS 445 Special Topics: Educational Game Design
- CS 445 Special Topics: Experimental Game Design
- DIGM 461 Computer Gaming Workshop I
- DIGM 462 Computer Gaming Workshop II

**Track Advisors:**

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Human-Computer Interaction

The design of a software system has a large impact on the way it is used. Humans can use computer systems more efficiently if the systems are designed with consideration of the user. Graphical user interfaces provide especially effective ways for humans and computers to interact. This track includes courses in the psychology of human-computer interaction, cognitive psychology, and computer graphics.

Courses:

CS 337 Human-Computer Interaction
CS 338 Graphical User Interfaces
CS 345 Computer Game Design
CS 430 Computer Graphics
CS 432 Interactive Computer Graphics
CS 435 Computational Photography
PSY 330 Cognitive Psychology

Track Advisors:

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Numeric & Symbolic Computation

Computational Science, Engineering and Mathematics enables us to model and simulate the world we live, create new virtual worlds, and explore many interesting phenomena. Numeric and symbolic computation along with high performance computing provide the tools that make this happen. This track shows students how to use computers to solve many of today’s complex scientific, engineering, and financial problems.

Courses: 
(recommended in bold)

MATH 300 Numerical Analysis
CS 300 Applied Symbolic Computation

One computational course in physics, chemistry, biology, mathematics, computer science or finance.

Track Advisors:

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Software engineering is the application of processes, methods, and tools to the problem of building and maintaining computer software with a defined level of quality, at a predictable cost, on a predictable schedule. This track prepares students for careers as software engineers in industry and research with an emphasis on the ability to analyze, design, verify, validate, implement, apply, and maintain software systems.

**Courses:**

SE 320 Software Verification and Validation  
SE 310 Software Architecture I  
(Computer Design can be a substitute for SE 310)  
SE 311 Software Architecture II  
CS 361 Concurrent Programming

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