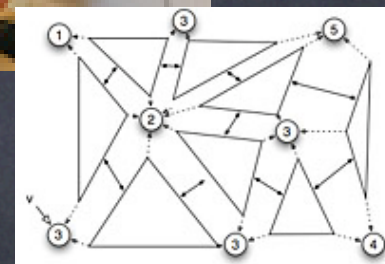
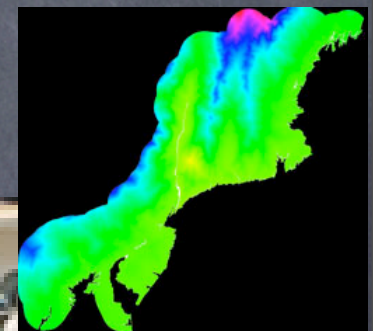
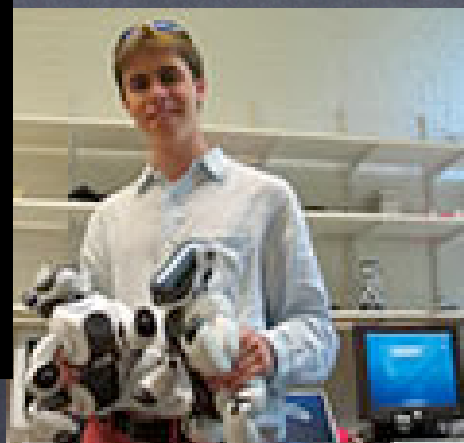
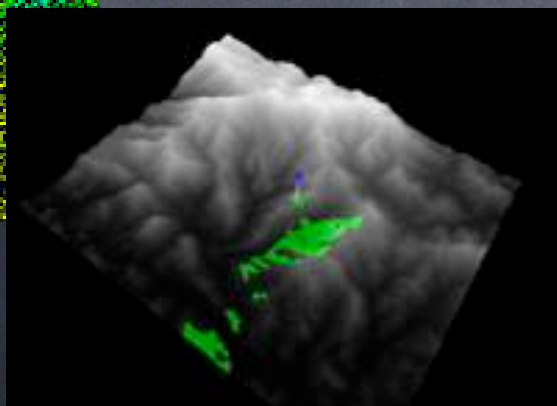
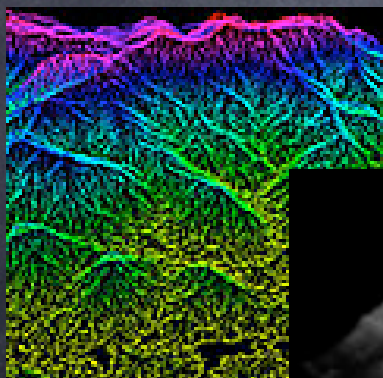
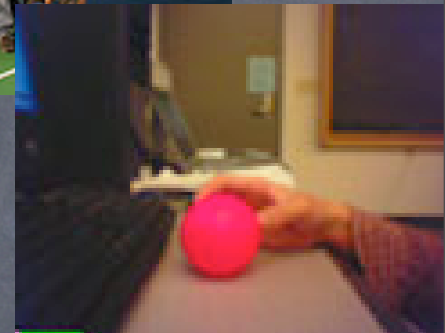
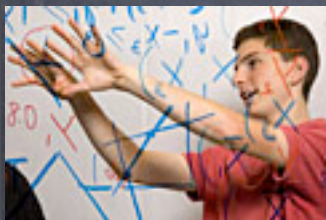




Bowdoin Computer Science



What is computer science, what are its applications in other disciplines, and its impact in society?



101: Introduction to CS

- Pre-requisites: none
- Assumes no prior knowledge of programming or computers.

- Provides a broad introduction to computer science and programming through real-life applications.
- How to think carefully and how to solve problems more effectively
 - applicable far beyond computer science
- Java Programming

The major in Computer Science

1 entry-level class

101
Introduction to CS

5 core classes

210
Data Structures

cs 231
Algorithms

cs 270
Artificial
Intelligence

cs 289
Theory of
Computation

Math 200
Introduction to
mathematical
reasoning

3 electives

320
Robotics

340
Spatial Data
Structures

350
GIS

355
Cognitive
Architecture

360
Computer
and Network
Security

375
Optimization
and Uncertainty

380
Computer G

260
Software Design

291-294
Intermediate
Independent
Study

401-404
Advanced
Independent
Study

Independent Studies and Honors

- Computer Science faculty research
 - Eric Chown
 - robot soccer and cognitive science
 - Steve Majercik
 - artificial intelligence and planning
 - Laura Toma
 - algorithms and GIS
 - Adriana Palacio
 - cryptography and information security

The minor in Computer Science

101
Introduction to CS

+

210
Data Structures

+

3 additional classes

cs 231
Algorithms

cs 270
Artificial
Intelligence

cs 289
Theory of
Computation

Math 200
Introduction to
mathematical
reasoning

320
Robotics

340
Spatial Data
Structures

350
GIS

355
Cognitive
Architecture

360
Computer
and Network
Security

375
Optimization
and Uncertainty

380
Computer G

260
Software Design

291-294
Intermedi
Independent
Study

401-404
Advanced
Independent
Study

Bowdoin Computer Science

Location: Searles, 2nd floor



The image shows a screenshot of a web browser displaying the Bowdoin Computer Science department website. The browser window title is "Computer Science (Bowdoin)" and the address bar shows "http://www.bowdoin.edu/computer-science/". The website has a dark green header with the "Bowdoin" logo and navigation links for "About", "Academics", "Admissions", "Campus Life", and "Gateways". Below the header, the page title is "Computer Science" and there is a search bar. A left sidebar contains a menu with links to "Computer Science", "Courses", "Curriculum", "Faculty & Staff", "Faculty Research", "Student Projects", "Robotics", "Computer Science Labs", "Outside Resources", "Department Handbook", and "Students & Alumni". The main content area features three images: a person at a computer, a person working with a robot on a green field, and a building. Below the images is a paragraph of text describing the department's programs and philosophy. A right sidebar contains a "Departments" section with links to "Northern B...", "Takes Thir...", "Champions...", "Bowdoin S...", "Robotics C...", "RoboCup T...", "Abroad Wi...", "Prepares f...", "Computer...", "Launch Hu...", "New GIS L...", "for the Co...". At the bottom right, there is a "Robocup" logo.

Computer Science (Bowdoin)

http://www.bowdoin.edu/computer-science/

berg svn+ssh ~ltoma GIS Bowdoin google Borges CCLI CiteSeer NSF CAREER FastLane BostonTang

Computer Science (Bowdoin)

A-Z Index

Bowdoin

About Academics Admissions Campus Life Gateways

Location: [Bowdoin](#) / Computer Science

Enter search w

Computer Science

- Computer Science
- Courses
- Curriculum
- Faculty & Staff
- Faculty Research
- Student Projects
- Robotics
- Computer Science Labs
- Outside Resources
- Department Handbook
- Students & Alumni



Computer science is a dynamic and exciting scientific discipline. The Computer Science Department at Bowdoin offers [major and minor programs](#), as well as an interdisciplinary major with mathematics. These programs support the fundamental liberal arts philosophy that emphasizes breadth and depth of study, critical analysis of ideas, exposure to different modes of inquiry, a mature style of writing and other forms of discourse, and multicultural awareness through off-campus study. These programs provide a solid foundation for either postgraduate study or a career in industry.

[more »](#)

Depa

- Northern B
- Takes Thir
- Champions
- Bowdoin S
- Robotics C
- RoboCup T
- Abroad Wi
- Prepares f
- Computer
- Launch Hu
- New GIS L
- for the Co

Academic Nev

Robocu

ROBOCUP

The major in Computer Science

5 core classes

210
Data Structures

cs 231
Algorithms

cs 270
Artificial
Intelligence

cs 289
Theory of
Computation

Math 200
Introduction to
mathematical
reasoning

210: Data Structures

- A study of basic data structures, their efficiency, and their use in solving computational problems.
- Programming intensive

231: Algorithms

- Explores a variety of solutions for fundamental problems while introducing the main techniques for the design and analysis of algorithms.
- Theoretical

270: Artificial Intelligence

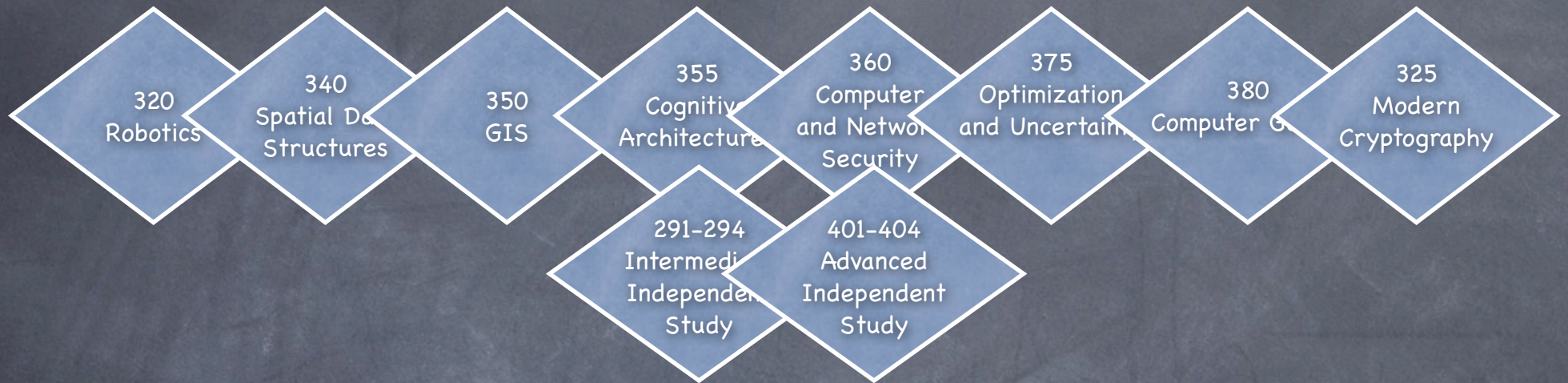
- Explores the principles involved in programming computers to do tasks that would require intelligence if people did them.
- Theoretical + programming

289: Theory of Computation

- What can a computer do? What is computation? What are the limits of computation?
- Theoretical

The major in Computer Science

3 electives

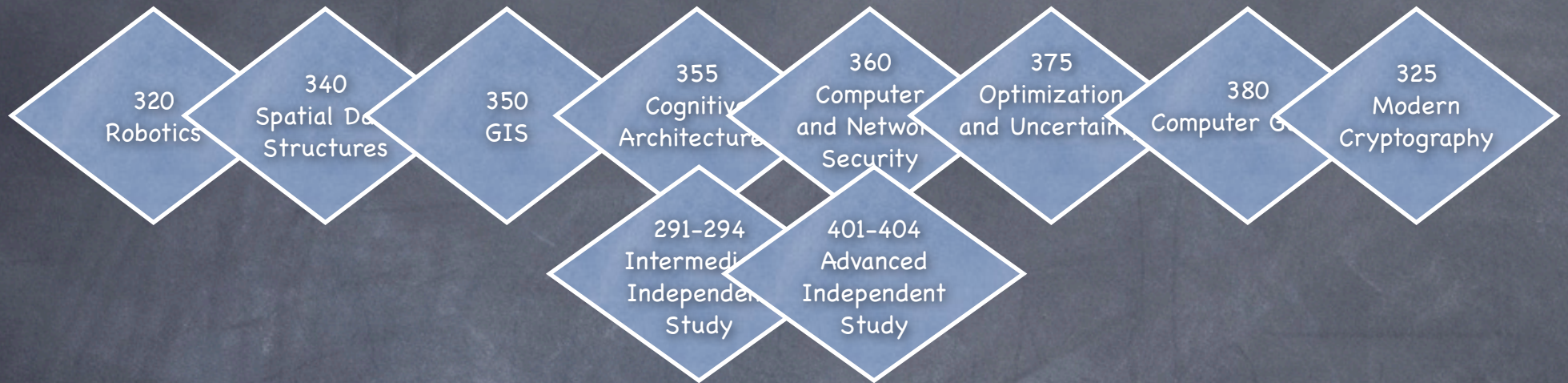


🌀 320: Robotics

- 🌀 Robotics incorporates ideas from a number of different areas—artificial intelligence, cognitive science, operations research—in pursuit of an exciting goal: programming robots to do useful tasks.
- 🌀 Challenge: build effective models of the world using inaccurate and limited sensors, and using such models for efficient robotic planning and control.
- 🌀 Students address these problems from both a theoretical and a practical perspective. Robot soccer
- 🌀 Theory and programming

The major in Computer Science

3 electives

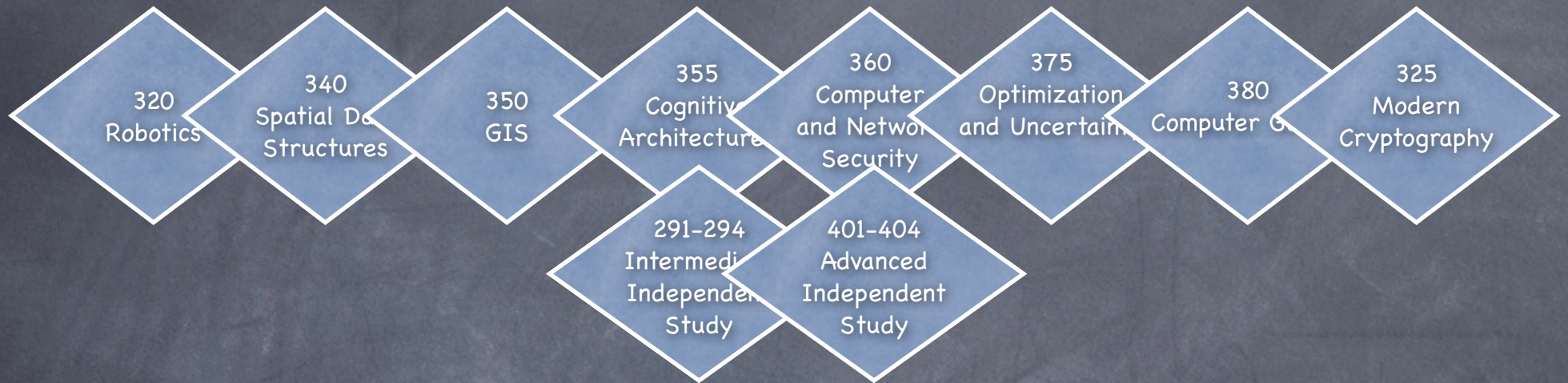


340: Spatial Data Structures

- In many disciplines the data being collected have spatial coordinates.
- Presents algorithms and data structures for problems involving spatial data, exploring both their theory and practical efficiency.
- Includes topics from spatial database design and computational geometry
 - triangulations, spatial join, range searching, nearest-neighbor queries and window queries; techniques for dynamization of spatial data structures; clustering techniques and external memory algorithms.
- Theory and programming

The major in Computer Science

3 electives

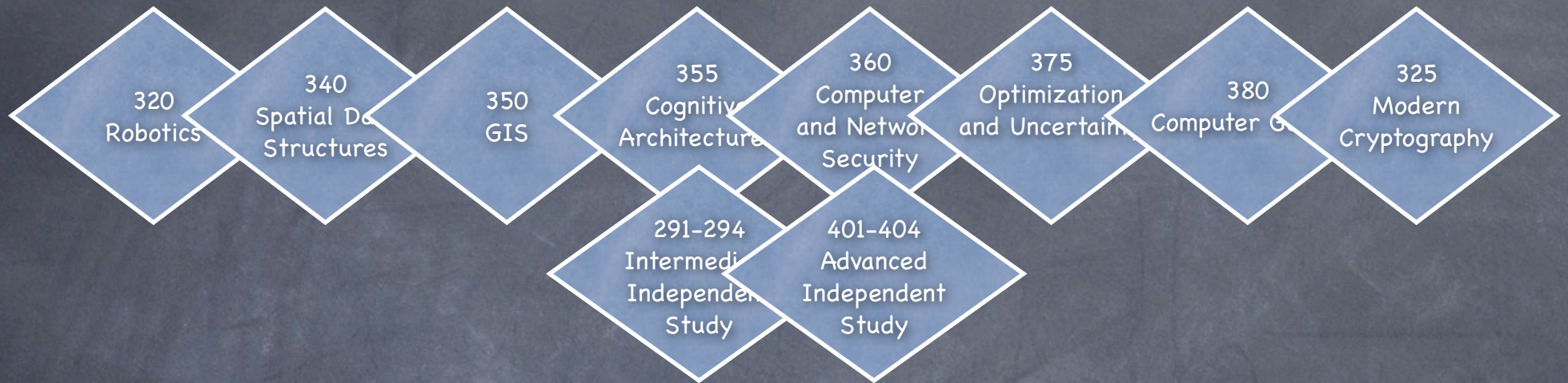


350: Geographic Information Systems (GIS)

- GIS handle geographical data: boundaries of countries; course of rivers; height of mountains; location of cities, roads, railways; power lines.
- GIS can help determine the closest public hospital, find areas susceptible to flooding or erosion, track the position of a car on a map, or find the shortest route from one location to another.
- GIS provide a rich source of new research problems in computer science.
- Topics covered include data representation, meshing and simplification, flow, overlay and visibility.
- Theory and programming

The major in Computer Science

3 electives

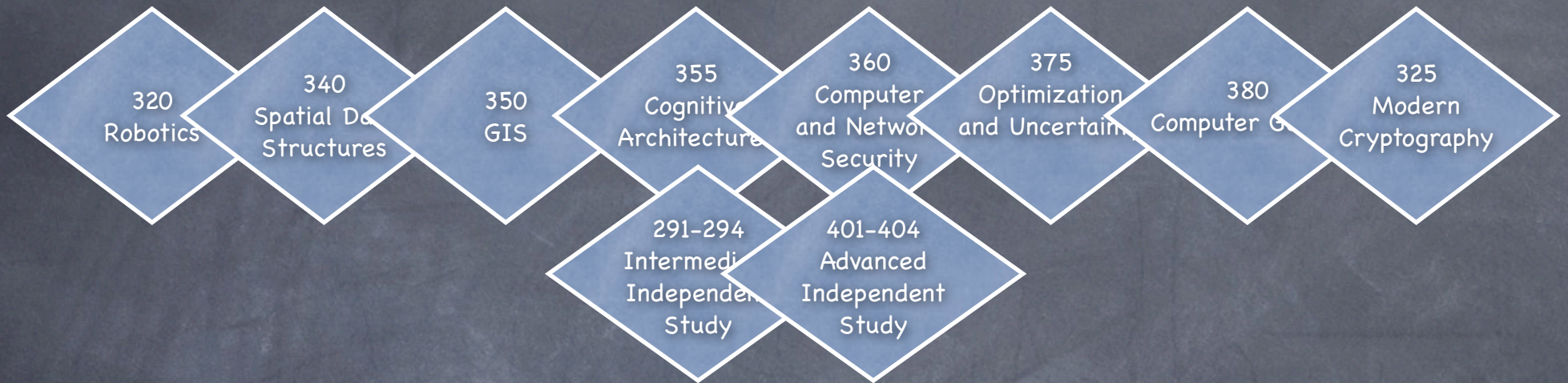


355: Cognitive Architectures

- Explores the architecture and mechanisms that the human brain uses to process information. In many cases, these mechanisms are contrasted with their counterparts in traditional computer design.
- A central focus is to discern when the human cognitive architecture works well, when it performs poorly, and why.
- The course is conceptually oriented, drawing ideas from computer science, psychology, and neuroscience.
- Theoretical

The major in Computer Science

3 electives

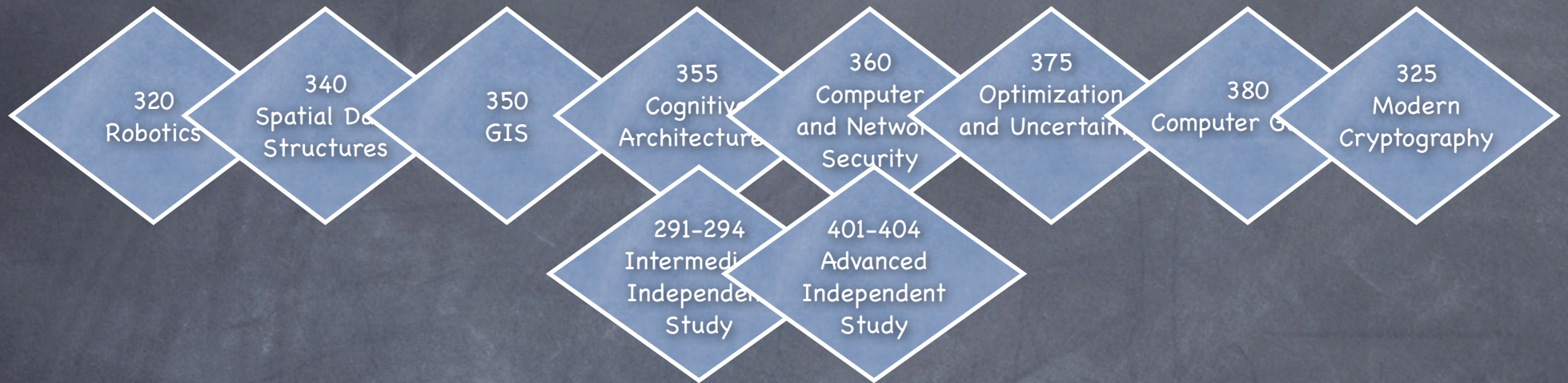


• 360: Computer and Network Security

- The smooth functioning of society increasingly depends on the flow of information through computer networks.
- Explores privacy and authenticity of information

The major in Computer Science

3 electives

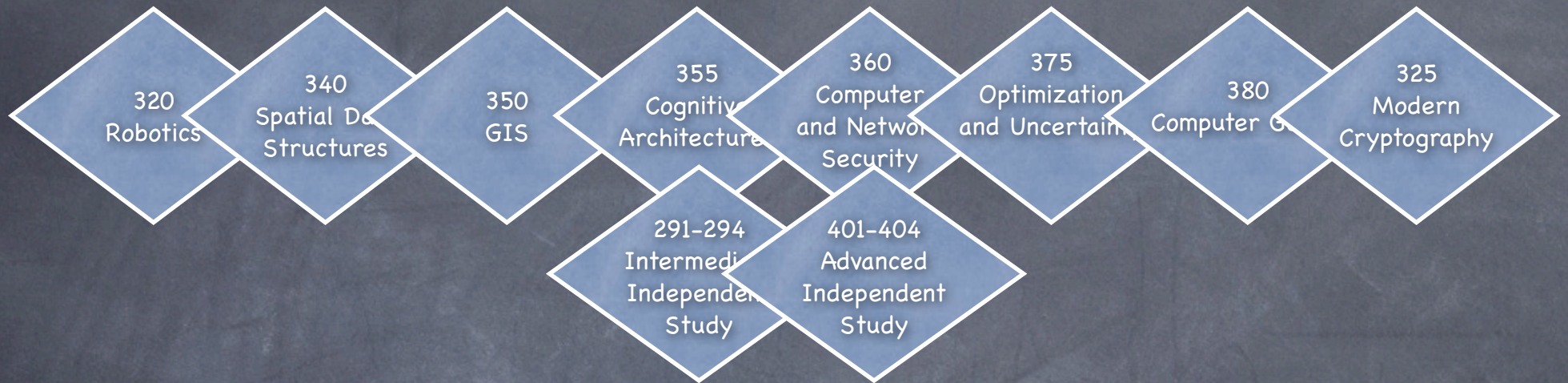


375: Optimization and Uncertainty

- Optimization problems and coping with uncertainty arise frequently in the real world.
- Expressed using a numeric framework, which permits performance guarantees for algorithms.
- Topics include constraint satisfaction, systematic and non-systematic search techniques, and probabilistic inference and planning.
- Theory and programming

The major in Computer Science

3 electives

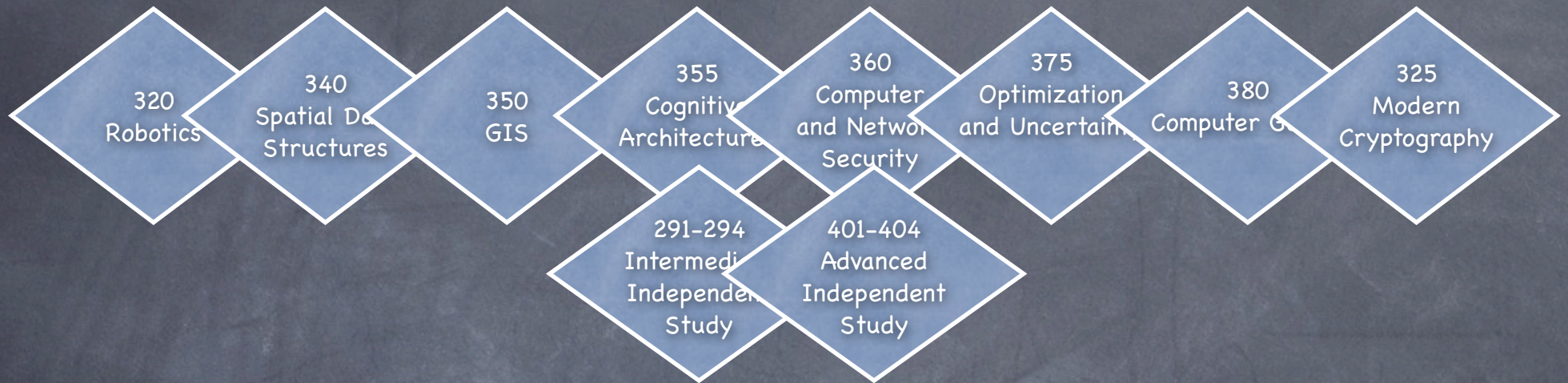


380: Computer Games

- Computer games: a test-bed for the development of new techniques in AI
- AI techniques are becoming increasingly necessary in commercial computer games to provide interesting, realistic synthetic characters (entities, human or otherwise, that assist or oppose the game player).
- Explores this symbiosis by studying a subset of AI techniques that are relevant to the creation of synthetic characters in computer games, using these techniques to create AI-endowed synthetic characters (e.g. characters that can learn from their experience and thus do not become predictable), and testing them in actual computer games.
- Theory and programming

The major in Computer Science

3 electives

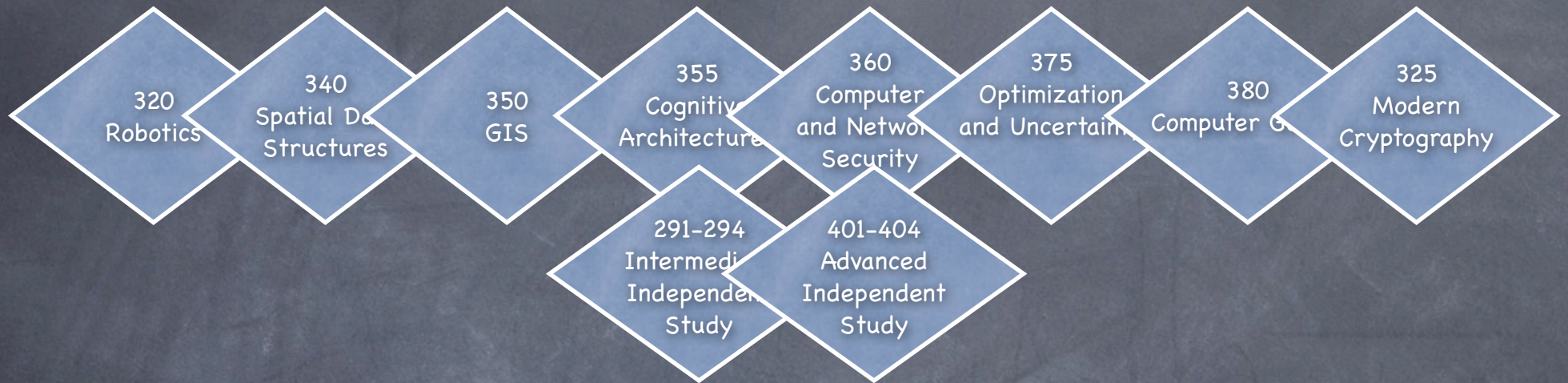


• 325: Modern Cryptography

- An introduction to modern cryptography, covering topics such as block ciphers, private-key encryption, hash functions, digital signatures, public-key encryption, RSA, public-key infrastructure, and various applications.
- Theoretical, emphasizes a rigorous mathematical approach

The major in Computer Science

3 electives



- 291-294, 401-404: Independent Study & Honors