***Fall 2017*
Problem Solving**
FYSEM-UA 597
Instructor: Dennis E. Shasha
Monday, 2:00-4:30 p.m.
Required cohort meeting: Wednesday. 2:00-3:15 p.m.
*Note: conflicts with* *Opportunity Programs Freshman Colloquium (Monday, 3:30-4:45 p.m.).*

*Prerequisite: Some programming experience in Python, Java, Javascript, R, or C.*

Many problems in science, business, and politics require heuristics—problem-solving techniques that often work well but give imperfect guarantees. This course teaches heuristics as they apply to the design of scientific experiments, the resolution of economic or political negotiations, and the construction of engineering devices in hostile environments. Students will work in small teams that will solve puzzles, conduct experiments, and build strategies for a competitive auction game. Students will use and learn computational tools such as Python. The intent is to make you better able to face complex problems in any field of study you choose.

DENNIS SHASHA is a Professor of Computer Science at the Courant Institute of New York University and an Associate Director of NYU Wireless. He works with biologists on pattern discovery for network inference; with computational chemists on algorithms for protein design; with physicists and financial people on algorithms for time series; on DNA computing for microbiomes; on methods to improve machine learning; and on computational reproducibility. Other areas of interest include database tuning as well as tree and graph matching. Because he likes to type, he has written six books of puzzles about a mathematical detective named Dr. Ecco, a biography about great computer scientists, and a book about the future of computing. He has also written five technical books about database tuning, biological pattern recognition, time series, DNA computing, resampling statistics, and causal inference in molecular networks. He has co-authored over seventy journal papers, seventy conference papers, and twenty patents. He has written the puzzle column for various publications including *Scientific American*, *Dr. Dobb's Journal*, and the *Communications* of the ACM. He is a fellow of the ACM and an INRIA International Chair.