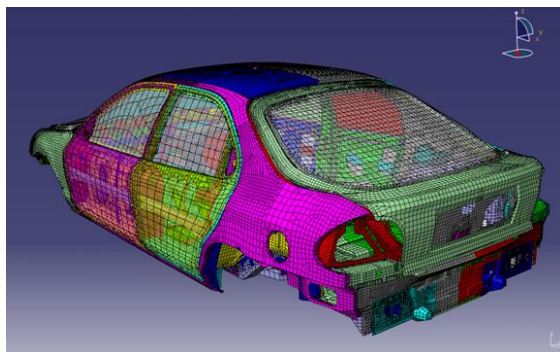
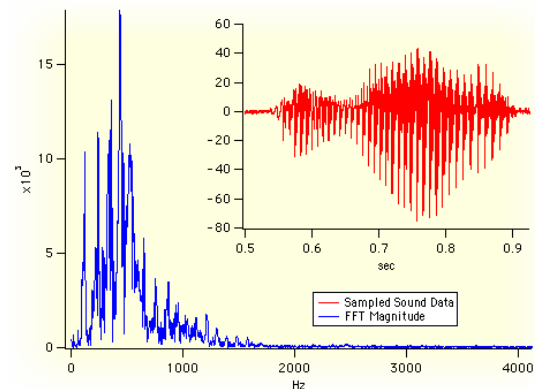


# Numerical Methods I

Instructor: Dr. Pavel Solin

Numerical Methods I is an introductory course to Computational Science and Engineering (CSE). This is a new and increasingly important field that employs high-performance computers to solve complicated problems in engineering design, robotics, transportation, weather prediction, hydrology, chemistry, biology, medicine, energy, national security and defense, and many other fields. Nowadays, computers are capable of unbelievable *petaflops* ( $10^{15}$  floating point operations per second). This course provides an introduction to techniques that will allow you to use computers to solve mathematical models efficiently.

We will start from the beginning and proceed in a step by step fashion. We will learn how to interpolate and approximate complicated functions with polynomials, solve problems involving nonlinear algebraic equations, compute complicated integrals that cannot be done "on paper", solve large systems (such as millions) of linear algebraic equations, and compute approximate solutions to ordinary differential equations and simpler partial differential equations. If you like math or engineering, programming, and computers, this course might be the right thing for you.



In addition to course notes and internet resources, we will use the textbook *K. Atkinson, W. Han: Elementary Numerical Analysis, 3rd edition, J. Wiley & Sons, 2003*. You will be required to work with a computer, and the knowledge of a high-level computer language (such as Matlab, Python, C++) is a prerequisite. I'll be glad to talk to you about the course in more detail. Feel free to stop by in my office (AB 624) any time, or send an e-mail to [solin@unr.edu](mailto:solin@unr.edu).