

MATH/CSCI 4010/8016: Recursive Functions

MW 5:30 PM – 6:45 PM | DSC 111 | Dr. Andrzej Roslanowski

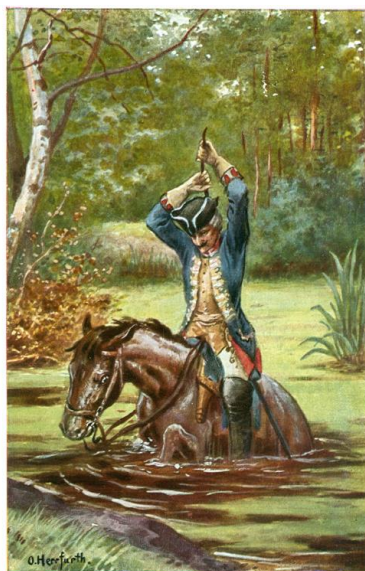
Recursion theory is a branch of mathematical logic which is of fundamental importance for computer science and for the theory of computation. It started in the early 1930s with the question:

What does it mean for a function on the natural numbers to be computable?

The field has since expanded to include the study of generalized computability and definability. Soon it occurred that the recursion theory overlaps with proof theory and effective descriptive set theory.

In the course we start with primitive recursive functions, PRC classes and operations on them. Then we will introduce a very simple programming language and partially computable functions. After those tools are developed, we continue with coding objects by natural numbers, the universal program, RE sets, oracles and arithmetic hierarchy. Many results presented in class will make you wonder:

Isn't this like Baron Munchausen pulling himself out of a mire by his own hair?



Munchausen O. Herforth pinx.

Isn't this python eating itself?



To make sure that we do not end up lost in contradictions, we will stick to a very formal proof-oriented approach to mathematics. However, in order to understand the main topics in the course, it suffices that the students have some experience with proof-oriented mathematics. All advanced materials will be developed in the course when needed.

Pre-requisites: MATH 2230 or CSCI 3660, or permission of instructor.

Textbook: Instructor's lecture notes available through Canvas

For More Information:

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