

Berufungsvorträge "Mathematische Logik mit Berücksichtigung der Grundlagen der Informatik"

Die Berufungsvorträge schließen folgende Punkte mit ein:

Didaktischer Vortrag (25 Minuten) Fragen/Pause (10 Minuten) Wissenschaftlicher Vortrag (45 Minuten) Fragen/Pause (15 Minuten) Kommissionelles Hearing -(Dekanatsbesprechungszimmer, 11. Stock)

Dienstag, 16. Oktober 2018, Hörsaal 16

Dr. Ekaterina Fokina (Technische Universität Wien)

15:00 Uhr: Didaktischer Vortrag

"Algorithms and Computability"

The talk is intended to be the first lecture in the series of lectures on computability theory and/or theory of algorithms. It can be a part of any introductory course on mathematical logic or theoretical computer science. Furthermore, it can also be used as the very first lecture of more specialized and profound courses, for example, on computability or complexity theory, as well as automata theory. We will start with a general discussion of the intuitive idea of algorithms and computation. We will identify some properties that allow us to say that a specific description is an algorithm, or that a specific process is a computation. We will then briefly discuss at least one of the ways to formalize the idea through the notion of computable functions and relations. The concept of computability will be extensively used in our second talk.

15:35 Uhr: Wissenschaftlicher Vortrag

"Infinite structures presentable by an algorithm"

In this talk we consider infinite, finitely presentable structures revealed step by step by an algorithm. Even though being infinite, such structures possess a finite description, thus, allowing one to manipulate them by finite means in finite time. Infinite, finitely presentable structures can be seen as an intermediate case between the classical infinite structures, that have a long history of investigation in mathematics, and of finite structures, intensively studied in theoretical computer science. Algorithmically presentable structures have also received quite some attention, but nevertheless, many fundamental questions are still open in the area. One of the main mysteries in this context is the relation between structural (algebraic), semantic and algorithmic properties of these structures presentable by a program for a Turing machine. These include questions about existence of such presentation for a structure, complexity of relations between such structures, complexity of various properties of computable structures, applications to algorithmic learning, etc. Our main working examples for the talk will be various kinds of computable and non-computable graphs. We will also point out the main challenges and open questions for further investigation.