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Fakultät für Mathematik

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)

Montag, 15. Oktober 2018, Hörsaal 17

Prof. Jörg Brendle
(Kobe University)

14:50 Uhr: Didaktischer Vortrag
“Kardinalzahlen und Kardinalzahlinvarianten”

Anhand von Beispielen und Beweismethoden (z.B. Diagonalargument) werden die Begriffe der Kardinalzahl und der Kardinalzahlinvariante erklärt und motiviert.

15:25 Uhr: Wissenschaftlicher Vortrag
“Almost disjoint families”

Almost disjoint families of subsets of the natural numbers play an important role in set theory and its applications to other areas of mathematics. For example, they have been used for almost disjoint coding in forcing theory and for the construction of the Isbell-Mrowka space in general topology. More recently, the solution of important problems about almost disjoint families has led to the development of sophisticated forcing techniques. In my talk, I will present the basic definitions, sketch proofs of a few classical results, and give some motivation as to why we study almost disjoint families. The second half of the talk will be devoted to recent research results.

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Dienstag, 16. Oktober 2018, Seminarraum 11

Dr. Vera Fischer
(Universität Wien)

9:00 Uhr: Didaktischer Vortrag
“Computable partial functions”

The class of general recursive functions is defined as the smallest class of partial functions $f: \mathbb{N}^k \to \mathbb{N}$ where $k \in \mathbb{N}$, which contains the constant zero functions, the successor function, the projection functions, and which is closed under composition, primitive recursion and the μ −operator. A simple model of a computing machine is a register machine, an idealized version of present day computers. Not only is every general recursive function computable by a register machine, but also every register machine computable functions is general recursive. This fact is evidence towards the Church-Turing thesis, which states that any formalization of the informal notion of “effective calculability” leads to the very same class of functions: the computable partial functions.

9:35 Uhr: Wissenschaftlicher Vortrag
“On some set-theoretic aspects of the real line”

The notion of a cardinal characteristic of the continuum emerged with the development of analysis in the late 19th century. The associated study of the infinitary combinatorial properties of the real line reveals many unexpected connections between its measure theoretic, algebraic and topological properties. Additionally it brings light to problems which are central to the foundations of mathematics and its axiomatization. In this talk, we will discuss some of the central ideas underlying the subject of cardinal characteristics of the real line and point out some interesting open problems in the area.

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(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. We will describe the most interesting and promising approaches that we have used to study computable structures, i.e., 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.