Lecture 4. Part 1. Nov. 12, 2014. Fibration sequences.

Lecture 4. Part 2. Nov. 12, 2014. 0-11min Fibration sequences.

11-16min Fiberwise weak equivalences.

16-24min The fpmap and its fibers.

Lecture 5. Part 1. Nov. 19, 2014. 0-5min More on fibration sequences.

5-12min h-levels of types.

12-15min h-levels of functions.

15-24min h-levels in classical mathematics.

24-30min h-levels of functions cont.

30-33min h-levels of maponpaths and some other special cases of functions.

33-43min Types of h-level 1 and general remarks.

43-47min A contractible type is a proposition.

47-50min h-level n implies h-level n+1.

50-55min More on types of h-level 1. Introducing hProp.

55-the end of the file Resizing rule. Impredicativity.

Lecture 5.Part 2. Nov. 19, 2014. 0-6.5min The difference between bool and hProp.

6.5-15min Canonicity for bool. Weak canonicity. Canonicity for nat.

15-17.5min Univalent canonicity conjecture for nat.

17.5-23.5min More on weak canonicity.

23.5-27.5min Why there is no canonicity after adding the axiom of excluded middle.

27.5-33min More discussion on modeling Coq in Coq.

33-34min About proof of canonicity and its conditionality.

34-the end of the file Meta-theories for proofs of relative consistency.

Lecture 6. Part 1. Nov. 25, 2014. 0-4min Univalence axiom - definition.

4-10.5min Connection of the univalence axiom to Church's extensionality.

10.5-13:30min Function extensionality for morphisms to the empty type is introduced and discussed.

13:30-17min Connection between extensionality and canonicity for the identity types.

17-24min Connections between univalence and constructive extensionality. Cubical type theory.

24-26min Uses of function extensionality for functions to the empty type. More properties of inclusions. (Note: in the present version of the UniMath the function extensionality for the empty type was moved lower to the beginning of the file uu0c.v)

26-27:30min The definition of a set. Elementary facts.

27:30-43min Complements. The union of the complement to an object with the point. Isolated points. Types with decidable equality. Some discussion about weq X when X is given with an isolated point x. Application to the set of automorphisms of a finite set.

43min-51min Theorem that a type with decidable equality is a set. Discussing why equality in circle is undecidable.

51-53.5min More properties of h-levels related to disjoint unions and complements.

53.5-55min Definition of decidable propositions. Decidable inclusions.

55-to the end of the file General function extensionality is introduced. Short discussion of the eta-conversion.

Lecture 6. Part 2. Nov. 25, 2014. 0-4.5min Discussion of function extensionality and some simple consequences.

4.5-7min "Impredicativity" property of h-levels.

7-10.5min Different meanings of the word "impredicativity". The "size" of the excluded middle axiom as an example.

10.5-13min About the fact that all types whose name starts with "is" are propositions. Weak equivalences between weak equivalences. How these assertions will look in the cubical type theory?

13-15min Some remarks about whether it is good to have more models or fewer models.

15- 17.5min The theorem about the auto-equivalences of a type with a distinguished isolated point that was mentioned earlier. Decomposition of permutations into transpositions. Why did I want to formalize such things?

17.5min The course reached the end of uu0.v (that is now uu0a, uu0b, uu0c, uu0d).

17.5-23min Discussion of the structure of the rest of the library.

23-27.5 Example of the absolute value of the integral part of a rational number as a function that is constructed using set-quotients and other univalent ideas but which computes $(|int(10/(-3))| = 4)$

27.5-29min Further comments on the structure of the library.

29-34min About the formalization of the category of simplicial sets and how from there one can go to the formalization of the classical homotopy theory.

34-end of the file A question about the pre-category Δ.