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Proof assistants for mathematics and computer science

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Torsdag den 14. april klokken 16 i Koll G3

Proof assistants are computer programs that can be used to develop and verify mathematical proofs in an utmost trustworthy way. In the last decade, proof assistants have become invaluable tools to verify complicated theorems whose proofs are beyond most mathematicians' grasp. Most notably, they have been used to verify the Four Color Theorem, the Feit-Thompson Theorem, and the Kepler Conjecture.

Proof assistants have also started to blossom in software verification; an area in which extremely large proofs are commonplace. Since modern software keeps on growing, ensuring the correctness of software (i.e. the correct functioning and absence of bugs) has become a task that cannot be handled without computer assistance. Proof assistants have, for example, been used to prove the correctness of an optimizing C compiler (CompCert) and an operating system (seL4).

In this talk I will give an introduction to proof assistants, and discuss their use in both mathematics and computer science. In particular, I will indicate how proof assistants are used in my recent research projects: formalization of the C programming language and verification of fine-grained concurrent algorithms.

*Mød op, hør foredraget og grib chancen for at blive medlem af Eulers Venner.
Vi giver kaffe, te og kage.*