Treehehe: An interactive visualization of natural deduction proof trees

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***Abstract*—Natural deduction proofs are commonly illustrated as proof trees to make the structure of the argument salient. A proof tree can be tedious to record and as a static object it does not realize its full potential as a route to comprehension of the proof it represents. There is literature on how to use visualization to support mathematics education and implementations of visual tools to walk through real analysis proofs [1], but none of this related work addresses the use of interactive proof trees or visualization for the proof theory community. To address this gap, we implement a tool for interacting with visual representations of natural deduction proof trees to provide insight into the structure of the proof and its founding logic. The proof visualization tool allows either open exploration of a proof or a directed walk-through, revealing supplementary information to serve as a form of discourse as the nodes are visited. This work provides a tool for gaining understanding of the structure of natural deduction proofs, insight into the processes used in constructing such proofs, and also serves as a starting point for visualizations of proof trees in more complicated logics.**

***Index Terms*—information visualization, visual analytics, proof visualization, proof tree, natural deduction, mathematics education**

References

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[2] Colin Ware. *Information Visualization: Perception for Design*. Morgan Kaufman, third edition, 2013.