1023-03-79   **Grigori Mints*** (`mints@csli.stanford.edu`), Department of Philosphy, Stanford University, Stanford, CA 94305. *Model elimination and cut elimination.* Preliminary report.

A new cut elimination method is obtained here by "proof mining" (unwinding) from the following non-effective proof that begins with extracting an infinite branch $\mathcal{B}$ when the canonical search tree $\mathcal{T}$ for a given formula E of first order logic is not finite. The branch $\mathcal{B}$ determines a semivaluation so that $\mathcal{B} \models \bar{E}$.

(*) Every semivaluation can be extended to a total valuation.

For every derivation d of E and every model $\mathcal{M}$, $\mathcal{M} \models E$.

This is a contradiction showing that $\mathcal{T}$ is finite, $\exists l \mathcal{T} < l$. A primitive recursive function $L(d)$ such that $\mathcal{T} < L(d)$ is obtained using instead of (*)

(**) For every r if the canonical search tree $\mathcal{T}^{r+1}$ with cuts of complexity $r+1$ is finite, then $\mathcal{T}^r$ is finite.

Here reduction of $(r+1)$-cuts does not introduce new r-cuts but preserves only one of the branches. (Received July 28, 2006)