bits and pieces

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References

📄 Douglas R. Hofstadter, *Gödel, Escher, Bach: An Eternal Golden Braid*, Basic Books, Inc., New York, NY, USA, 1979.

📄 Robert Nieuwenhuis, Thomas Hillenbrand, Alexandre Riazanov, and Andrei Voronkov, *On the evaluation of indexing techniques for theorem proving*, Automated Reasoning (Rajeev Goré, Alexander Leitsch, and Tobias Nipkow, eds.), Lecture Notes in Computer Science, vol. 2083, Springer Berlin Heidelberg, 2001, pp. 257–271.

Hofstadter's Law: It always takes longer than you expect,
even when you take into account Hofstadter's Law.

— Douglas Hofstadter, Gödel, Escher, Bach: An Eternal Golden Braid

Unit Superposition Inference Rules

$$\frac{s \approx t \quad L[s']}{(L[t]) \cdot \sigma} \quad \text{unit paramodulation}$$

where $\sigma = \mathrm{mgu}(s, s')$, $s' \notin \mathcal{V}$, $t\sigma \not\succeq s\sigma$

$$\frac{s \approx t \quad u[s'] \not\approx v}{(u[t] \not\approx v) \cdot \sigma} \quad \text{unit superposition} \qquad \frac{s \approx t \quad u[s'] \approx v}{(u[t] \approx v) \cdot \sigma}$$

where $\sigma = \mathrm{mgu}(s, s')$, $s' \notin \mathcal{V}$, $t\sigma \not\succeq s\sigma$, $v\sigma \not\succeq u[s']\sigma$

$$\frac{s \not\approx t}{\square} \quad \text{unit equality resolution} \qquad \frac{A \quad \neg B}{\square} \quad \text{unit resolution}$$

where s and t (A and B respectively) are unifiable

$x = \mathsf{a} \vee x \neq \mathsf{a}$

$\mathsf{f}(\mathsf{a}) \neq \mathsf{f}(\mathsf{b})$

$R = \{x = \mathsf{a}\}$ is ground complete

$\sigma = \{x \mapsto \mathsf{b}\} \ (x = \mathsf{a})\sigma = \mathsf{a} \to \mathsf{b}$ with $\mathsf{a} > \mathsf{b} \ \mathsf{f}(a) \neq \mathsf{b}$

$\bot = \bot \vee \bot \neq \bot$

$\mathsf{f}(\bot) \neq \mathsf{f}(\mathsf{a})$

$P(a), \neg P(f(a, b)), f(x, b) = x$
$P(a), \neg P(f(a, b)), f(\bot, b) = \bot$
$\{f(x, b) = x\}$ is ground complete and with $\{x \mapsto a\}$ we get $\neg P(a)$