

$\Gamma \vdash \Sigma, \Omega \text{ } t :: A$



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$|$ Γ $|$ \vdash Σ, Ω t

$$||\Gamma||_{\Sigma,\Omega} t^d$$

$$\Gamma \vdash_{\Sigma, \Omega} t :: \textcolor{violet}{d} \ A$$



Soundness &

Completeness

What's a derivative mean for a vector?

Mod derivations are just bidirectional typing derivations with types erased.



$$\begin{array}{c}
\frac{x \in V}{V \vdash_{\Sigma, \Omega} x \Rightarrow} \text{VAR} \Rightarrow \quad \frac{\cdot \vdash_{\Sigma} A \quad V \vdash_{\Sigma, \Omega} t \Leftarrow}{V \vdash_{\Sigma, \Omega} (t \circ A) \Rightarrow} \text{ANNO} \Rightarrow \quad \frac{V \vdash_{\Sigma, \Omega} t \Rightarrow}{V \vdash_{\Sigma, \Omega} t \Leftarrow} \text{SUB} \Leftarrow
\end{array}$$

$$\frac{V, \vec{x}_1 \vdash_{\Sigma, \Omega} t_1^{d_1} \quad \dots \quad V, \vec{x}_n \vdash_{\Sigma, \Omega} t_n^{d_n}}{V \vdash_{\Sigma, \Omega} \text{op}_o(\vec{x}_1 \cdot t_1; \dots; \vec{x}_n \cdot t_n)^d} \text{OP}$$

$$\text{for } o: \Xi \triangleright [\Delta_1]A_1^{d_1}, \dots, [\Delta_n]A_n^{d_n} \rightarrow A_0^d$$





o



















