

# Linear Everywhere Dependent Type Theory (LEDTT)

## Variable localization:

Let  $\Gamma \vdash t : B$ . For every  $x : A \in \Gamma$  then the following holds:

- If  $x \in \text{FV}(\Gamma)$ , then  $x \notin \text{FV}(t)$
- If  $x \in \text{FV}(t)$ , then  $x \notin \text{FV}(\Gamma)$

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$$\emptyset \vdash \lambda a . \lambda x . x : (a : Type_0) \multimap (x : a) \multimap a$$

The diagram illustrates the linear resource usage of the lambda term  $\lambda a . \lambda x . x$ . It features three nodes:  $a$  (the argument of the first lambda),  $x$  (the argument of the second lambda), and  $a$  (the result of the application). There are three arcs: a top arc from the first  $a$  to the final  $a$  labeled '2', a bottom arc from the final  $a$  back to the first  $a$  labeled '0', and a middle arc from the first  $a$  to  $x$  labeled '0'. The middle arc is part of a larger arc that also connects to the final  $a$ .