CAT.
THEORY

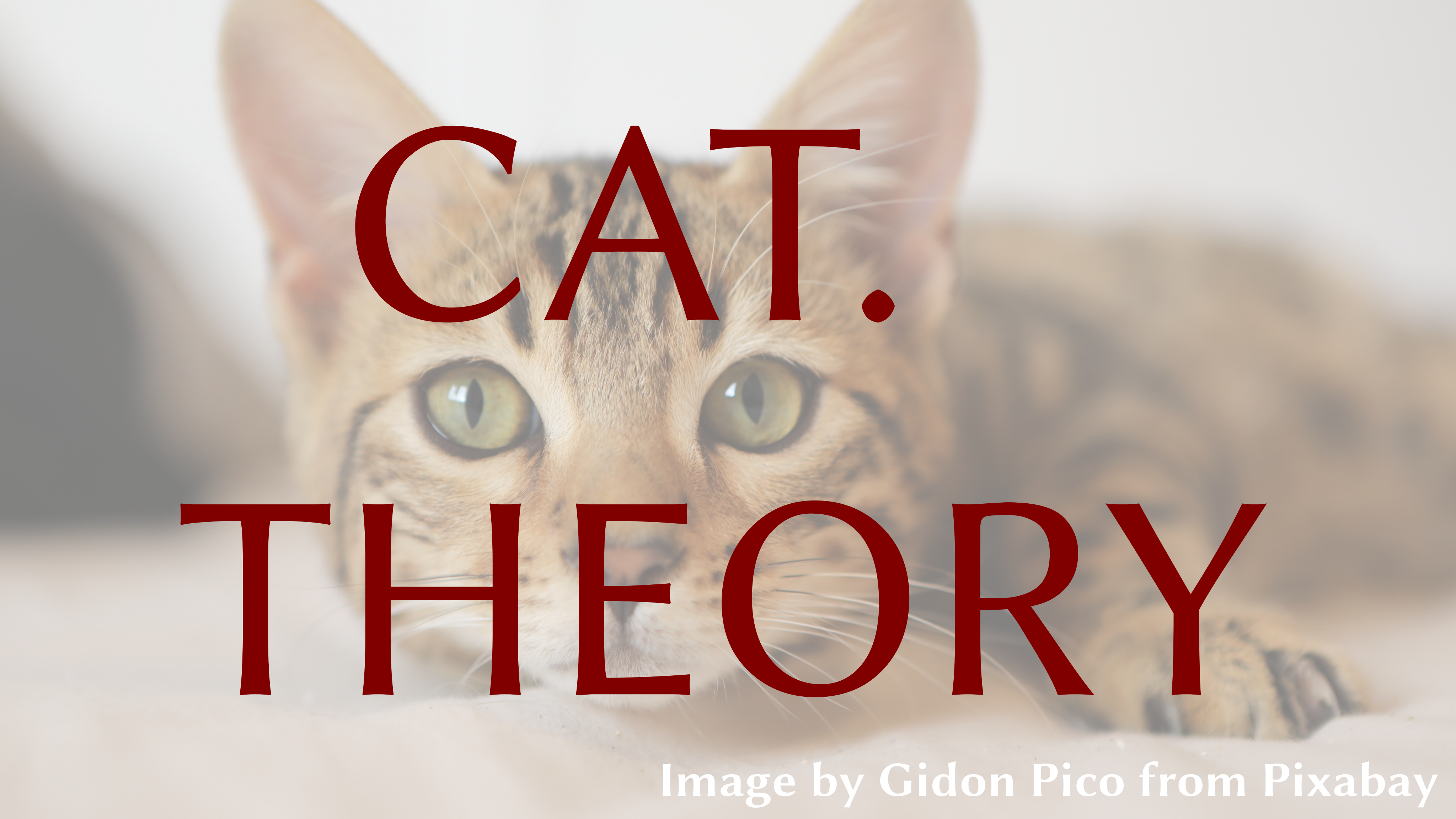
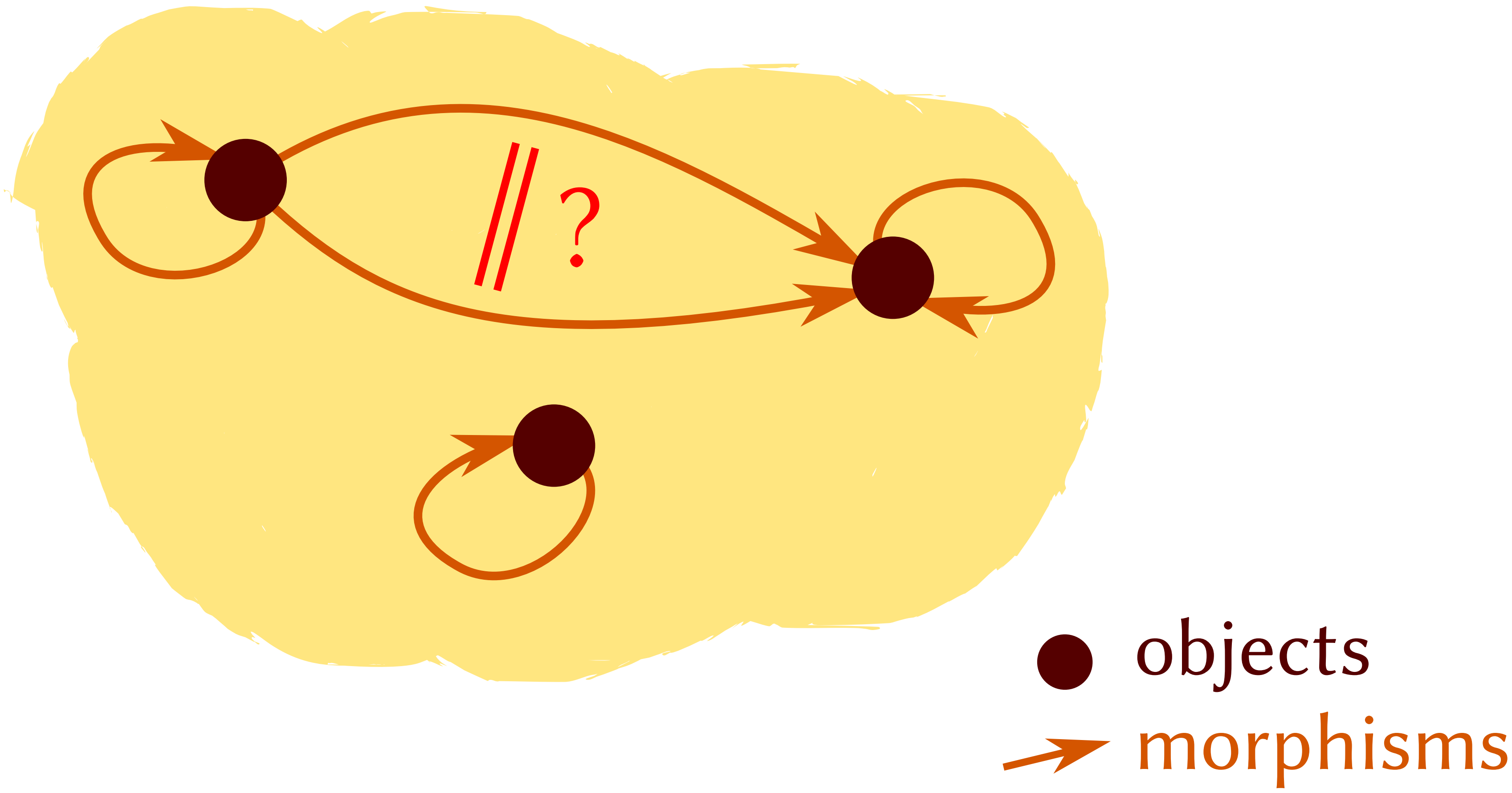
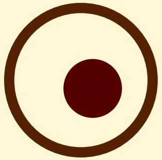
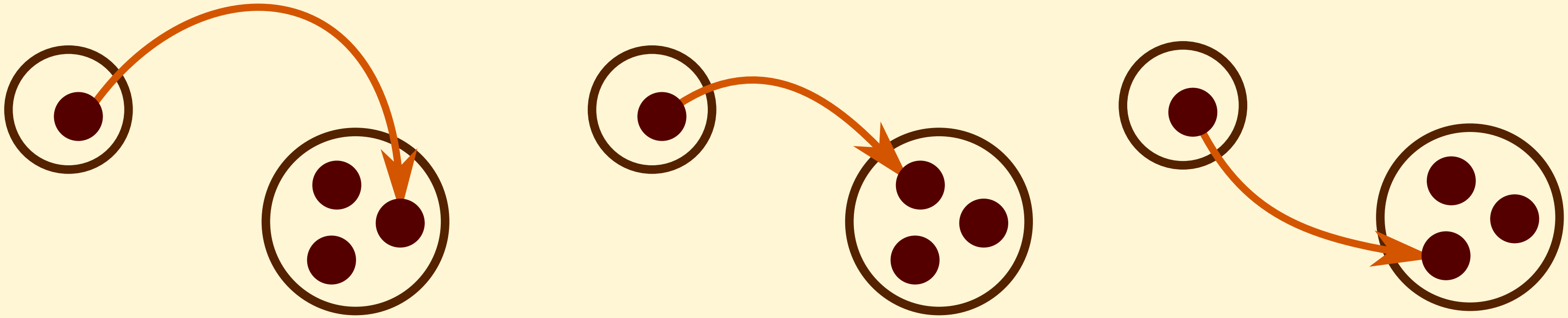


Image by Gidon Pico from Pixabay

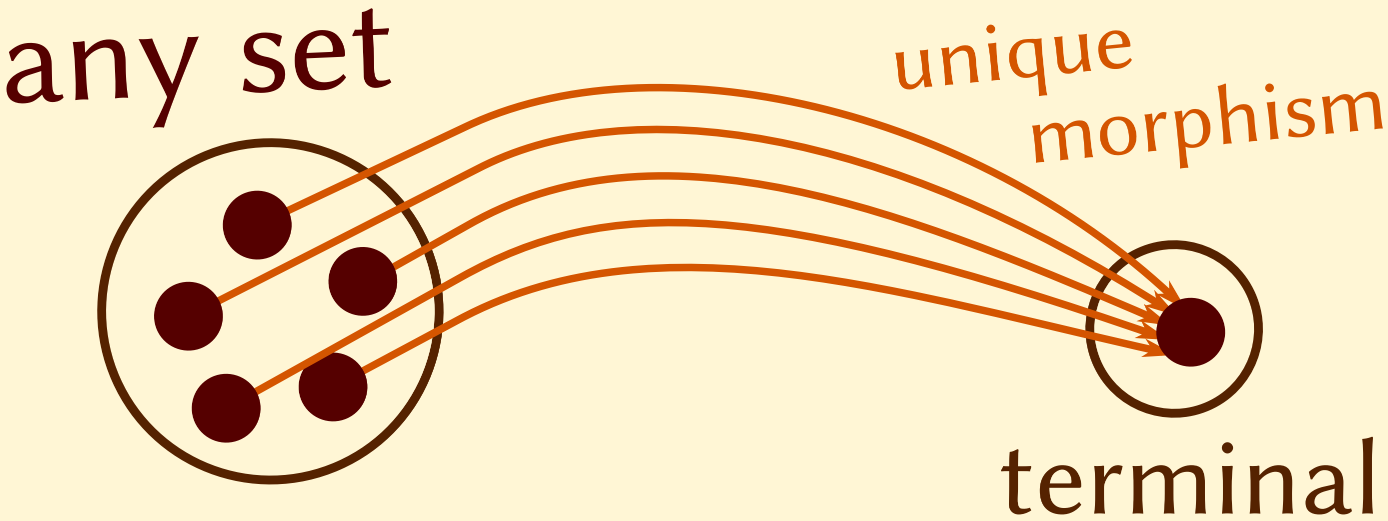

?
objects
morphisms

points in 

morphisms from 



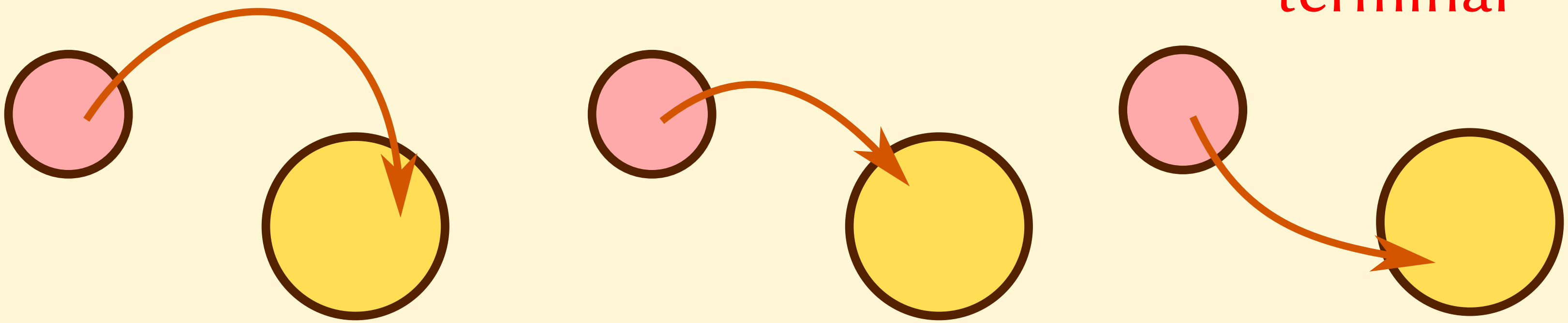
what is ⊙?



points in

morphisms from

terminal



Abstraction

category theory $\longleftrightarrow$ type theory

Universal Properties

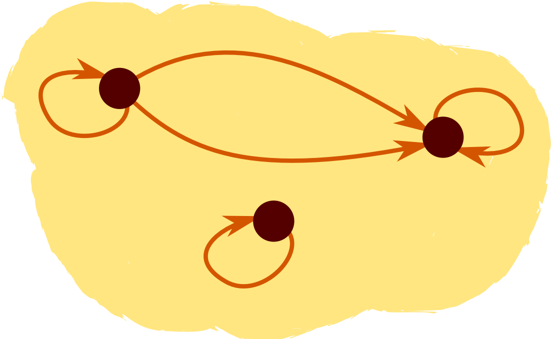
$\mathbb{N}$	most general $\mathbb{N}$-algebra
S1	most general S1-algebra
Id(M; N)	freely generated by **refl**
n-truncation	best n-type approximation

Categorical Aspects

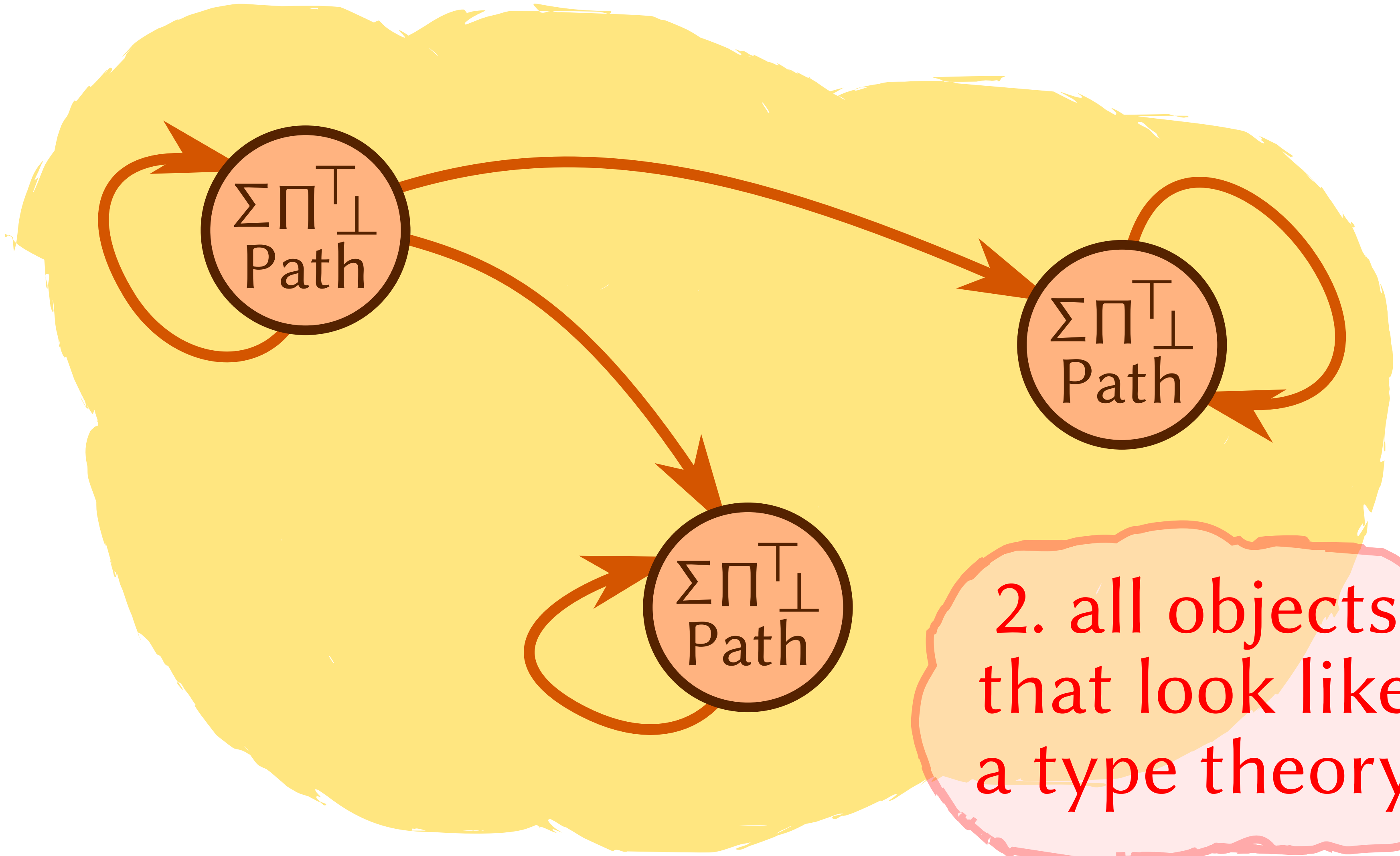
1. connectives in type theory

$\Pi \quad \top \quad \bot$

$\Sigma \quad \mathrm{Path}$



universal properties
in some category



2. all objects that look like a type theory

Comprehension categ ies

Categ ntexua

vith fa egorie

Categ

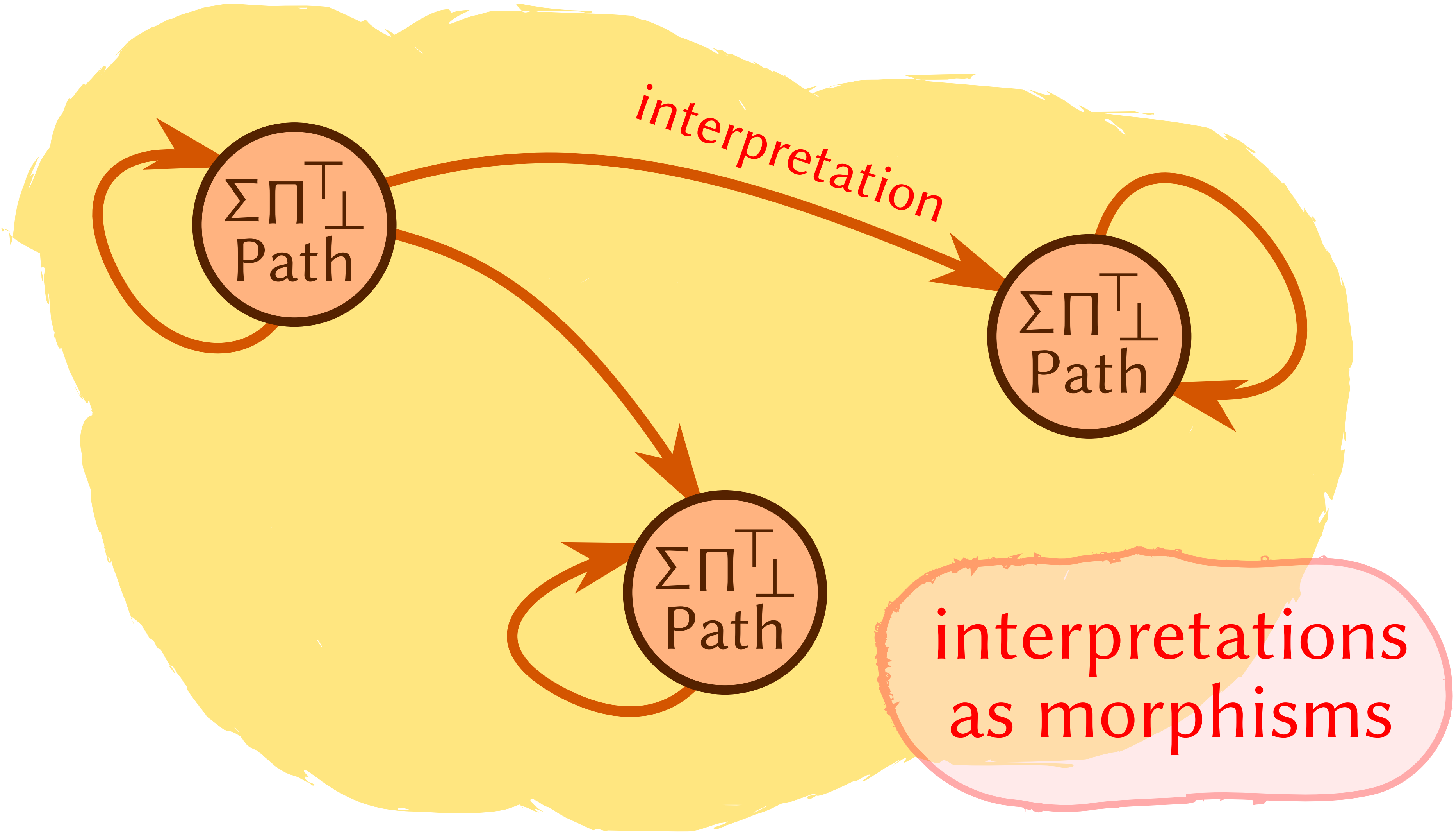
D ay ma

ith attributes

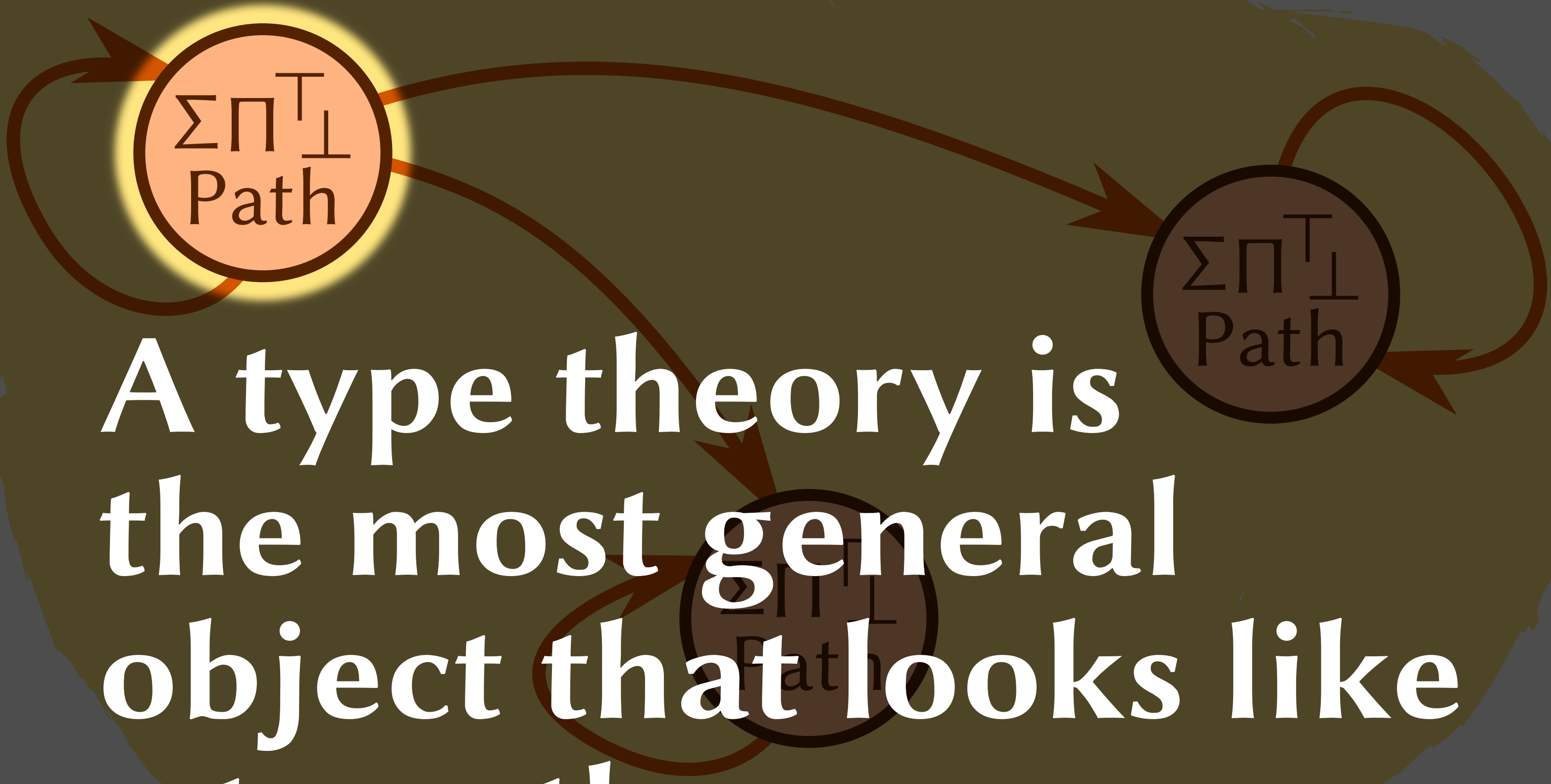
categories

$\Sigma\Pi^{\top}_{\perp}$

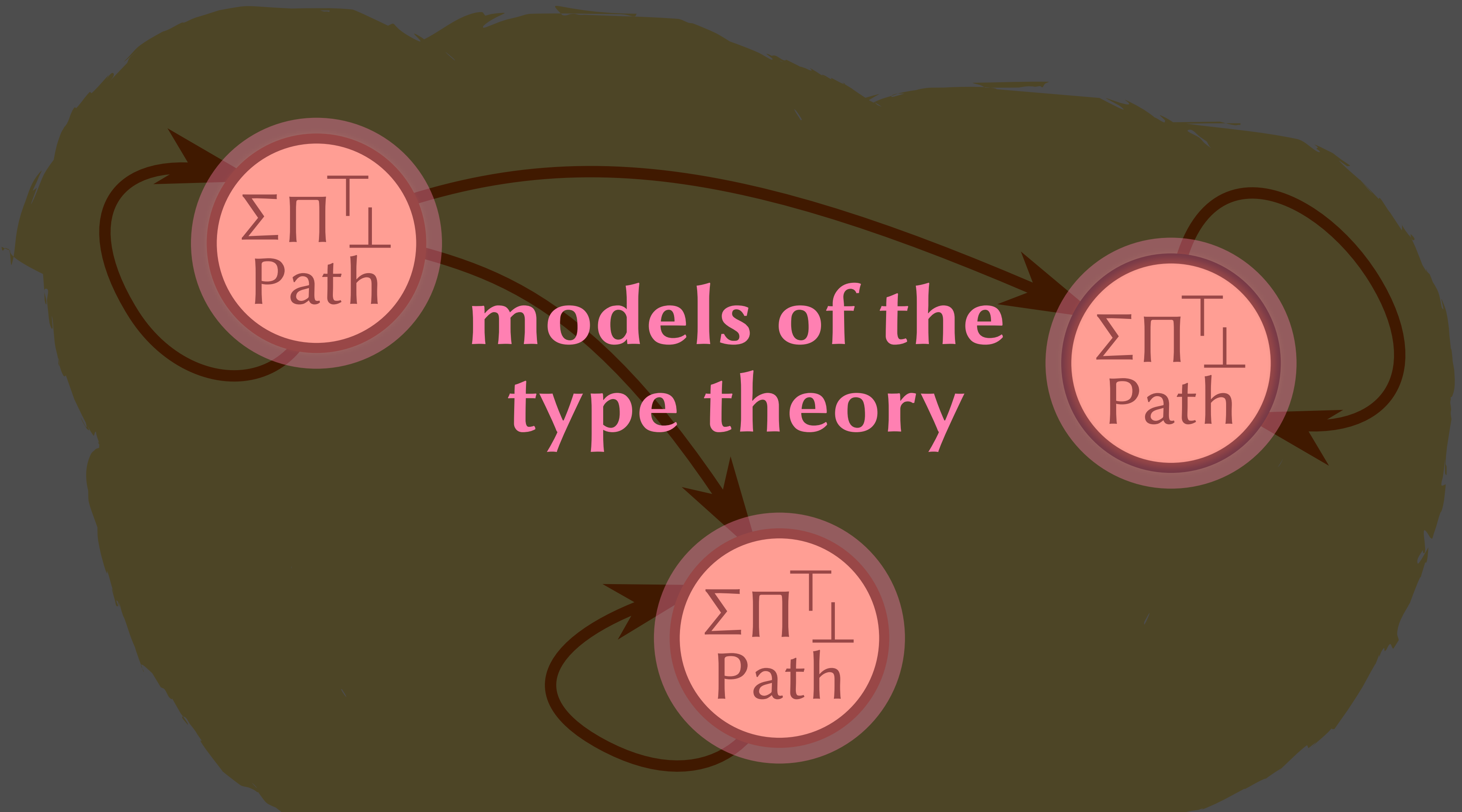
Path



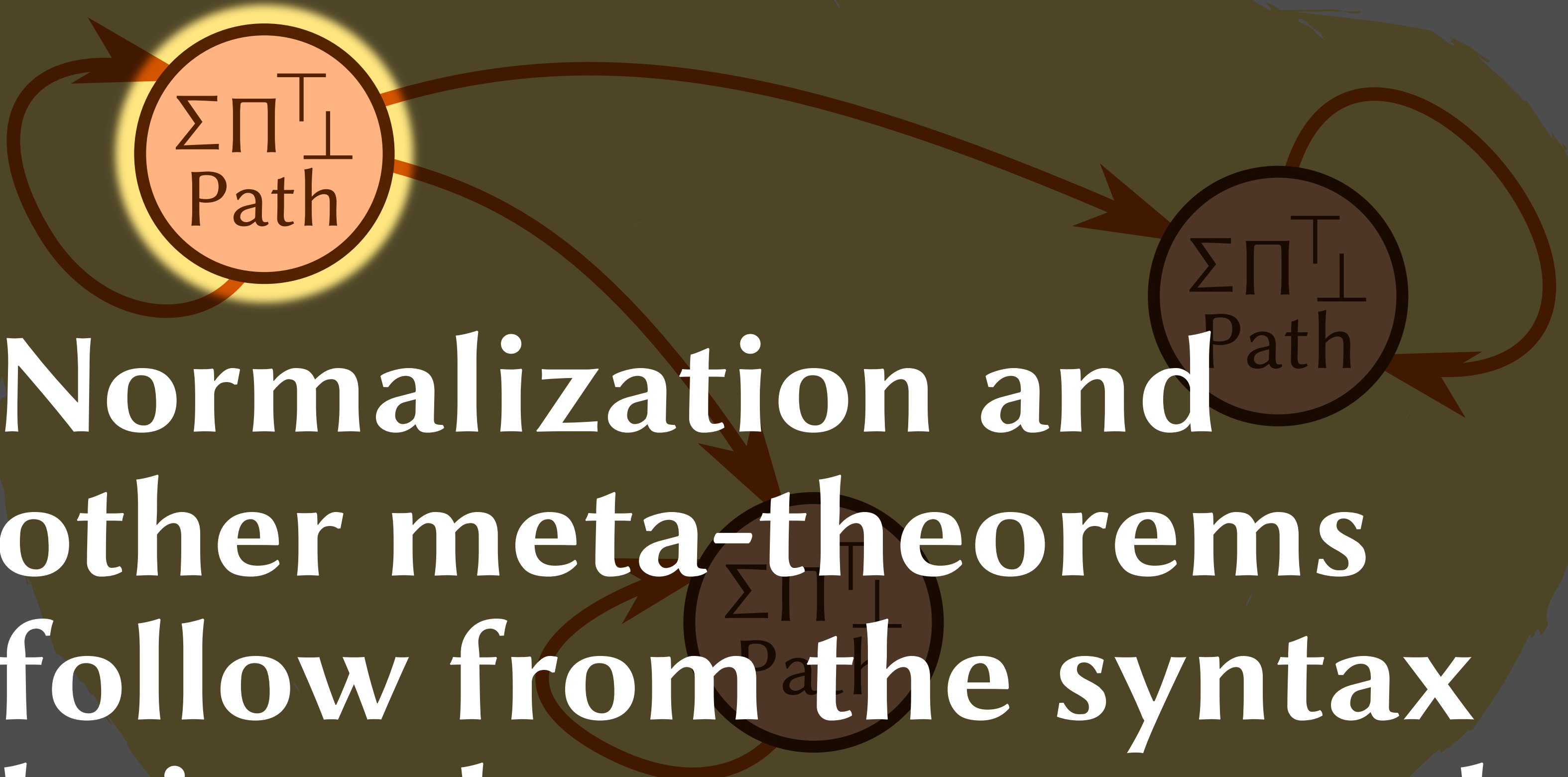
interpretation
ΣΠ⊤⊥ Path
ΣΠ⊤⊥ Path
ΣΠ⊤⊥ Path
interpretations
as morphisms



A type theory is the most general object that looks like a type theory



(the most general model is the theory itself)



Normalization and other meta-theorems follow from the syntax being the most general

Further Readings

Categorical Logic and Type Theory by Bart Jacobs

Categorical Logic by Andrew Pitts