

# Quasi Borel-spaces

[A convenient category for higher-order probability theory, LICS'17]

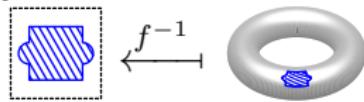
Ohad Kammar

Borel subsets of  $\mathbb{I}^2 := [0, 1]^2$

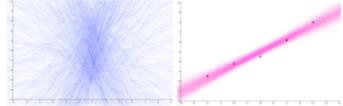


Measurable spaces

$f : \mathbb{I}^2 \rightarrow X$  measurable:



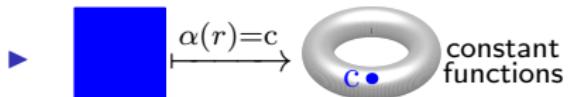
Example results



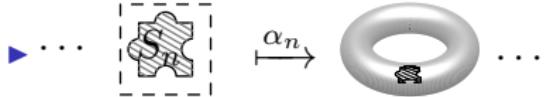
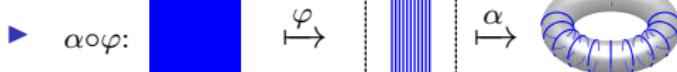
Distributions on functions  
(Bayesian regression)

Quasi-Borel spaces  $\langle X, M \rangle$

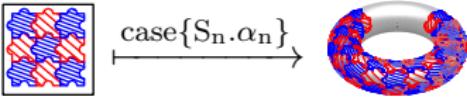
$(\alpha : \mathbb{I}^2 \rightarrow X) \in M$ : **random element**



composition:



countable  $\downarrow$  case-split



Grothendieck  
quasi-topos

Higher-order inference