Introduction to Topology in and via Logic
Kick-Off Meeting

Rodrigo N. Almeida, Søren B. Knudstorp

January 5, 2024

Introduction Round

- Who are you? (in a non-existentialist way)
- What is your background?
- Why are you interested in topology?

Practicalities and Organization

- Six lectures on core concepts of general topology
  - Given by Rodrigo and Søren.
  - On Mondays and Fridays of first three weeks, at 11am.
  - Hybrid and will be recorded.
- Threee tutorials on the contents of the course.
  - Given by Amity.
  - On Wednesdays at 17h00.
- Group presentations on more advanced topics
  - Given by you, the students.
  - On Tuesdays, Wednesdays and Fridays of fourth week.
  - Aimed at your fellow students.
- Three HW assignments
  - Similar to HWs in courses like MPML or IML.
  - Published on Jan 10, Jan 17, Jan 24 respectively.
  - Deadline is Feb 9.
  - Done in teams.

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What is Topology About: A Bit of History

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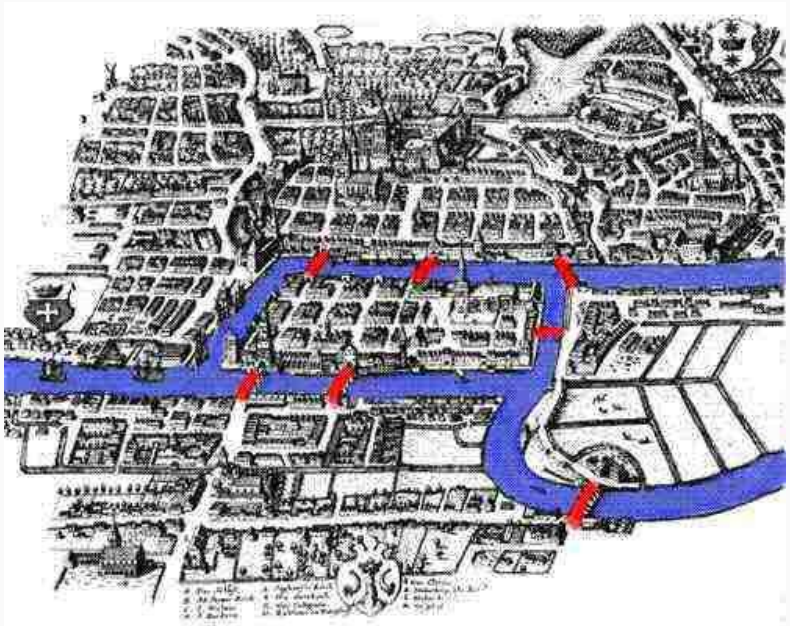

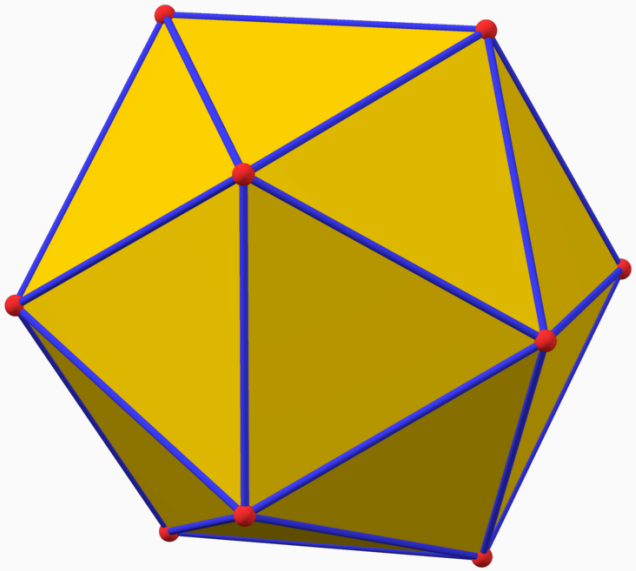

Figure 1: The Humble Origins of Topology

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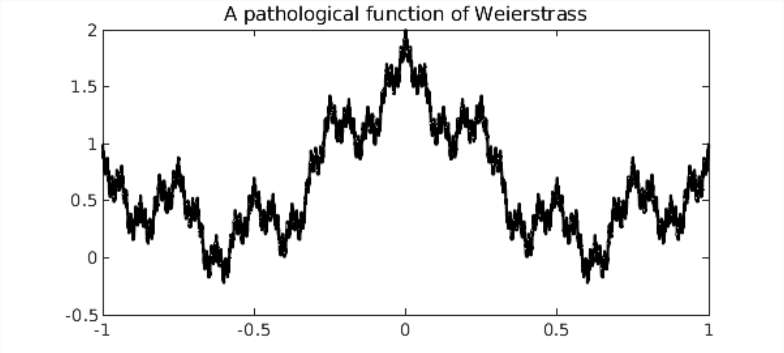
But then things got wild:



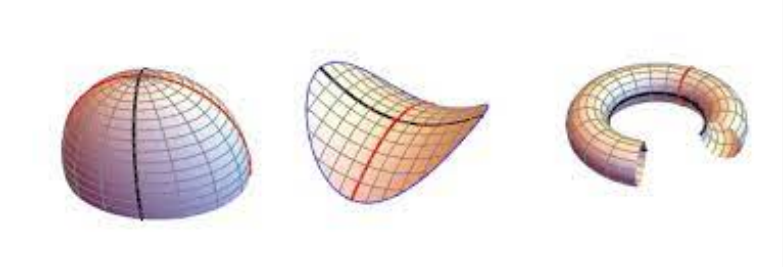
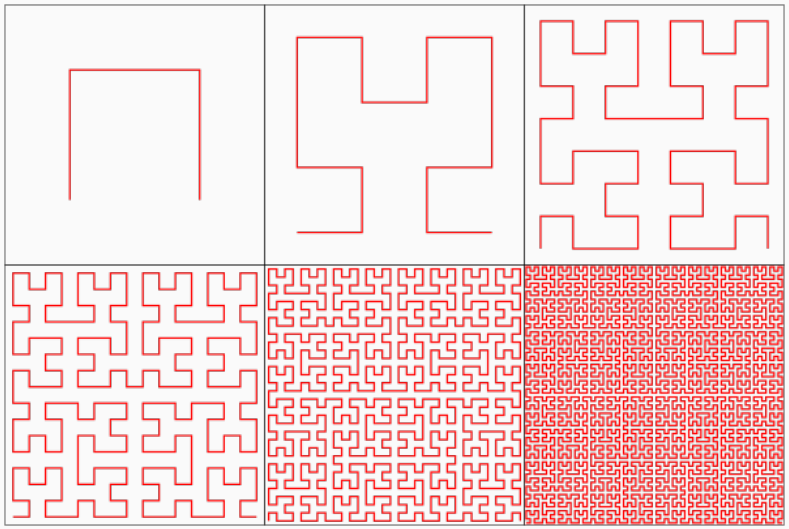


Figure 2: ????????



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Our approach will try to emphasise the epistemic angle as a way to bootstrap our understanding, but we will also discuss the geometric approach.

What is Topology: Epistemic Intuitions

A space is a pair (X, τ) where $\tau \subseteq \mathcal{P}(X)$ is a collection of *possibly knowable facts*. These are facts which can be verified – there is some procedure to generate them. Their complements are falsifiable statements.

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We want to think of τ as the "recursively enumerable" facts; those $A \in \tau$ such that $X - A \in \tau$ we say are decidable facts.

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4. Compactness: Being able to describe all worlds using finite amounts of information; having the space be appropriately "complete".
5. Connectedness: Disconnectedness is epistemically the capacity to have enough "decidable" propositions; connectedness is geometrically having the space be accessible through paths (or something close enough).

Thank you!
Questions?