Second Supplement to Chapter 11 of Sutherland,

Introduction to Metric and Topological Spaces (Second Edition)

Most of the time, the topological spaces which arise in geometry and analysis are either assumed or shown to satisfy Hausdorff Separation Property. However, there are places in the mathematical sciences where non ─ Hausdorff spaces arise naturally.   We have already mentioned the Zariski topology, which plays a fundamental role in algebraic geometry (see the notes for Chapter 7 and the file **http://math.ucr.edu/~res/math145A-2014/zariski-topology.pdf**). As noted in a file on the companion website for the textbook

http://fdslive.oup.com/www.oup.com/booksites/pdf/uk/companion/9780199563081/S.7.pdf

The Sierpiński space and related objects are highly relevant to some topics in computer science.   The following paper also discusses some of these connections.

> **I. Reilly,** _On non ─ Hausdorff spaces_, Proceedings of the Symposium
> on General Topology and Applications (Oxford, U. K., 1989), Topology
> and Its Applications **44** (1992), 331 ─ 340.

There is also further discussion of finite and other non ─ Hausdorff spaces on pages 99 ─ 100 of the following document in the course directory:

http://math.ucr.edu/~res/math145A-2014/grad-level-classnotes.pdf