Título:

Autor:

Editorial:

Tema:

Precio: $948.06

Año: 2009

Edición: 1ª

ISBN: 9780821836972

Sinopsis

A topological embedding is a homeomorphism of one space onto a subspace of another. The book analyzes how and when objects like polyhedra or manifolds embed in a given higher-dimensional manifold. The main problem is to determine when two topological embeddings of the same object are equivalent in the sense of differing only by a homeomorphism of the ambient manifold. Knot theory is the special case of spheres smoothly embedded in spheres; in this book, much more general spaces and much more general embeddings are considered. A key aspect of the main problem is taming: when is a topological embedding of a polyhedron equivalent to a piecewise linear embedding? A central theme of the book is the fundamental role played by local homotopy properties of the complement in answering this taming question.

The book begins with a fresh description of the various classic examples of wild embeddings (i.e., embeddings inequivalent to piecewise linear embeddings). Engulfing, the fundamental tool of the subject, is developed next. After that, the study of embeddings is organized by codimension (the difference between the ambient dimension and the dimension of the embedded space). In all codimensions greater than two, topological embeddings of compacta are approximated by nicer embeddings, nice embeddings of polyhedra are tamed, topological embeddings of polyhedra are approximated by piecewise linear embeddings, and piecewise linear embeddings are locally unknotted. Complete details of the codimension-three proofs, including the requisite piecewise linear tools, are provided. The treatment of codimension-two embeddings includes a self-contained, elementary exposition of the algebraic invariants needed to construct counterexamples to the approximation and existence of embeddings. The treatment of codimension-one embeddings includes the locally flat approximation theorem for manifolds as well as the characterization of local flatness in terms of local homotopy properties.