Title:	Counting Manifolds upto Homotopy and Homeomorphy
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Keywords:	Mathematics Surfaces Homology Homotopy Homotopy
Issue Date:	26-Jun-2015
Publisher:	IISER-M
Abstract:	The aim of this thesis is to closely study two results in the theory of clas- sification of manifolds attempting to count manifolds upto homotopy and homeomorphy and to give a detailed presentation of the classification of topological surfaces. Two proofs of classification of surfaces is presented. One notices that the homeomorphism classes of topological surfaces is countable motivating the question of counting the number of homeomorphism classes of all manifolds. This question is intercepted with a seemingly simpler question about ho- motopy classes of all topological manifolds possibly with boundary. Mather gives a pleasing answer to this question by proving that the homotopy classes of all compact manifolds possibly with boundary, are countable. We then study the question of homeomorphism classes of all compact topological manifolds closely following the work of Cheeger and Kister who prove that even this collection is countable. The plan of the thesis is as follows. First chapter gives a proof of classifi- cation theorem of surfaces assuming the difficult but classical theorem that all surfaces are triangulable. We follow the proof given in the book \Topol- ogy" by Munkres[7] very closely. Second chapter gives another proof of the classification theorem of surfaces by C.E. Burgess[1]. Third chapter explains Mather's theorem[6] on homotopy classification of all topological manifolds. The last chapter sketches the proof of a theorem of Cheeger and Kister[2] on homeomorphism classes of all topological manifolds. All manifolds in this thesis are topological manifolds, possibly with bound- ary specifically mentioned, everywhere.
URI:	http://hdl.handle.net/123456789/663 (http://hdl.handle.net/123456789/663)
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