

Steve Awodey

Cartesian Cubical Model Categories

 Springer

Contents

1	Introduction	1
2	Cartesian Cubical Sets	9
2.1	Cartesian Cubes	9
3	The Cofibration Weak Factorization System	13
3.1	The Cofibrant Partial Map Classifier	14
3.2	Relative Partial Map Classifier	15
3.3	The Cofibration Weak Factorization System	16
3.4	Uniform Filling Structure.....	18
4	The Fibration Weak Factorization System	27
4.1	Partial Box Filling (Biased Version)	27
4.2	Fibrations (Biased Version).....	28
4.3	Fibration Structure (Biased Version).....	30
4.4	Partial Box Filling (Unbiased Version)	33
4.5	Unbiased Fibration Structure	38
4.6	Factorization.....	40
5	The Weak Equivalences	43
5.1	Homotopy Equivalence	45
5.2	Weak Homotopy Equivalence	48
6	The Frobenius Condition	57
6.1	From Biased to Unbiased.....	58
6.2	Frobenius for δ -Biased Fibrations.....	58
7	A Universal Fibration	69
7.1	Classifying Families	69
7.1.1	A Realization-Nerve Adjunction.....	70
7.1.2	A Universal Family	72
7.1.3	Small Maps	75
7.1.4	Examples of Universal Families $\dot{\mathcal{V}}_\alpha \rightarrow \mathcal{V}_\alpha$	77
7.2	Classifying Trivial Fibrations.....	79

7.3	Classifying Fibrations.....	83
7.3.1	The Classifying Type of Biased Fibration Structures	83
7.3.2	The Classifying Type of Unbiased Fibration Structures	88
7.4	Realignment for Fibration Structure	90
8	The Equivalence Extension Property	95
8.1	The Sliced Premodel Structure	95
8.2	Pathobject Factorizations	103
9	The Fibration Extension Property	113
9.1	Fibrancy of the Universe.....	113
A	Axioms for Cartesian Cofibrations.....	121
B	Cartesian Cubical Sets Classifies Intervals.....	123
	References.....	131
	Index.....	135