AMPLE GROUPOID OF A (FINITELY ALIGNED) P-GRAPH WHERE P EMBEDS IN A GROUP

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Beginning in the 80s with the work of Enomoto, Fujii and Watatani, directed graphs and their generalisations (such as the P-graphs of Brownlowe, Sims and Vittadello) have been used to model C*-algebras. Associating an auxiliary groupoid to the graph has been a fruitful technique. This was demonstrated for directed graphs by Kumjian, Pask, Raeburn and Renault in the 90s, and demonstrated for finitely aligned higher-rank graphs by Kumjian, Pask, Farthing, Muhly and Yeend in the 2000s. In the present decade, Spielberg has given us a groupoid model for the non-finitely aligned setting. In fact, Spielberg's techniques apply to all left cancellative small categories, making the techniques as complex as the class of left cancellative small categories is broad. Moreover, the length functions that moderate the behaviour of the graph are omitted. We are interested in finding a more accessible groupoid for the non-finitely aligned setting. We reintroduce length functions to make this feasible.

In this talk, we associate a topological groupoid to any P-graph, where P is only assumed to be a submonoid of a group. We describe a sufficient condition for the groupoid to be ample. When the P-graph is finitely aligned, the sufficient condition holds, so the groupoid is ample. We discuss how to modify our construction to include non-finitely aligned P-graphs. Lastly, we highlight that our construction applies to discrete groups, in which case the groupoid is isomorphic to the group itself.

This work is being undertaken with my supervisors Lisa Orloff Clark and Astrid an Huef.

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