REWRITING OPEN GRAPHS

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Abstract. open graphs, their rewrites, and an application

1. Introduction

Our goal is to model open networks and their rewrites. By an *open network*, we mean a network together with a boundary. To make this precise, we begin with a category of 'input and output types' $\mathbf{C}$ and another category of 'networks' $\mathbf{D}$. To equip a network, an object of $\mathbf{D}$, with a boundary, a pair of objects from $\mathbf{C}$, we use an adjunction

$$C \underset{\longrightarrow}{\overset{\longrightarrow}{\perp}} D$$

With this setup, we focus on three categories.

The first category, denoted L- Span($\mathbf{D}$), has as objects, those from $\mathbf{C}$, and as arrows, cospans of the form

$$Lc \to d \leftarrow Lc'$$

inside of $\mathbf{D}$.

The second category, denoted L- Open, has cospans

$$Lc \to d \leftarrow Lc'$$

in $\mathbf{D}$ for objects and triples of arrows (f, g, h) such that

$$\begin{array}{ccccc} Lc & \longrightarrow & d & \longleftarrow & Lc' \\ {\scriptstyle L}\downarrow{\scriptstyle f} & & \downarrow{\scriptstyle g} & & {\scriptstyle L}\downarrow{\scriptstyle h} \\ Lc'' & \longrightarrow & d' & \longleftarrow & Lc''' \end{array}$$

commutes.

References

[1] G. Wraith. Artin glueing. *J. Pure Appl. Algebra*, 4:345–348, 1974. ISSN 0022-4049. doi:10.1016/0022-4049(74)90014-0. URL http://dx.doi.org/10.1016/0022-4049(74)90014-0.