Graded Generalized Algebraic Data Types

Harley Eades

October 11, 2022

Abstract

Write abstract

1 Introduction

Write the intro.

2 The Fundamental Theory

Suppose $\mathcal{C}$ is a category and $(\mathcal{E}, \otimes, I)$ is a strict monoidal category.

Definition 2.1 (Graded F-Algebra)**.** *For a functor* $\mathsf{F} : \mathcal{E} \times \mathcal{C} \longrightarrow \mathcal{C}$*, a graded* F*-algebra is a pair* (A, h) *that consists of a functor* $\mathsf{A} : \mathcal{E} \longrightarrow \mathcal{C}$ *and a family* h *of morphisms:*

$$h_{m,n} : \mathsf{F}(m, \mathsf{A}(n)) \longrightarrow \mathsf{A}(m * n)$$

*A **homomorphism** between two graded* F*-algebras* (A, h) *and* (B, h') *consists of a morphism*

$$\alpha : (\mathsf{A}, h) \longrightarrow (\mathsf{B}, h')$$

is defined as a natural transformation $\alpha : \mathsf{A}_1 \longrightarrow \mathsf{A}_2$ *such that:*

$$\mathsf{F}(\mathsf{m}, \alpha_{\mathsf{n}}); h'_{m,n} = h_{m,n}; \alpha_{m \otimes n}$$

References