Perceptually-driven Factored Spectral Projection System

Liang Shi(liangs@stanford.edu), Issac Kauvar(ikauvar@stanford.edu)

April 29, 2015

1   Project Description

Recently, extended color gamut displays are emerging in the consumer market, however, it still remains unclear that how to extend the color gamut of a display without sacrificing light throughput or making other tradeoffs. In our project, we try build up a perceptually-driven display which can adjust the color gamut adaptively based on the content need to display, while maximize the light output. We define the optimality as the error preceived by an observer, which can be modeled in the perceptually-uniform CIE Lab color space. We will propose an ADMM based non-linear optimization framework to factorize a color gamut target into a set of time-multiplexed pixel values for corresponding primaries. We will implement the algorithm on CIE 76, CIE 94 and CIE 2000 color difference standards to show its generality. In addition, a multi-primary projector with five different LEDs will be built up to demonstrate the effectiveness of the algorithm. This is a co-work with Issac Kauvar(not enrolled in EE368), Sam(not enrolled in EE368) and Prof. Gordon Wetzstein. This project does not need a DROID phone.

2   Reference

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[3]Teragawa M, Yoshida A, Yoshiyama K, et al. Review Paper: Multiprimarycolor displays: The latest technologies and their benefits[J]. Journal of the Society for Information Display, 2012, 20(1): 1-11.