

Generating Euler Diagrams Through Combinatorial Optimization

Supplemental Material

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In this document, we provide supplemental material that is not included in the main manuscript due to space limitations. First, we provide an additional visualization of the workflow. Afterwards, we show the influence of several parameter settings on the resulting Euler diagrams.

Figure I show the complete workflow for creating a smoothed Euler diagram from a superdual graph. In this example, the set system of the director Art Camacho from MovieDB is displayed.

The problem definition MCSETSYSTEMSIMPLIFICATION contains an objective function with a weighted sum of three individual objective functions. We show a single example of the simplification capabilities of our method in our paper. In this document, we show additional examples using different parameter values in this supplemental material.

Figure II shows eight simplification steps of the set system of Leigh Slawner. The total number of concurrencies of the Euler diagram with $\alpha = 0.01$ (Fig. IIa) is 23, which decreases to 2 for $\alpha = 3.75$ (Fig. IIh).

Figure III shows four simplification steps of the set system of Joel Schoenbach. The total number of concurrencies of the Euler diagram with $\alpha = 0.01$ (Fig. IIIa) is 16, which decreases to 0 for $\alpha = 2.0$ (Fig. IIId).

Figure IV shows three simplification steps of the set system of Jim Wynorski. The total number of concurrencies of the Euler diagram with $\alpha = 0.01$ (Fig. IVa) is 7, which decreases to 0 for $\alpha = 1.0$ (Fig. IVc).

Figure V shows three simplification steps of the set system of Art Camacho. The total number of concurrencies of the Euler diagram with $\alpha = 0.01$ (Fig. Va) is 4, which decreases to 0 for $\alpha = 1.5$ (Fig. Vc).

Figure VI shows three solutions of the set system of Leigh Slawner using different values for β . The parameter α is set to 2.25 for all three examples. In the left Euler diagram with $\beta = 0.1$, the number of faces adjacent to the outer face is 5, which is increased to 8 faces for $\beta = 1.0$. The Euler diagram shown in Figure VIa eval-

uates to $f_{\text{weight}} = 92$, $f_{\text{concur}} = 7$ and $f_{\text{outer}} = 5$. The diagram shown in Figure VIc evaluated to $f_{\text{weight}} = 90$, $f_{\text{concur}} = 7$ and $f_{\text{outer}} = 8$.

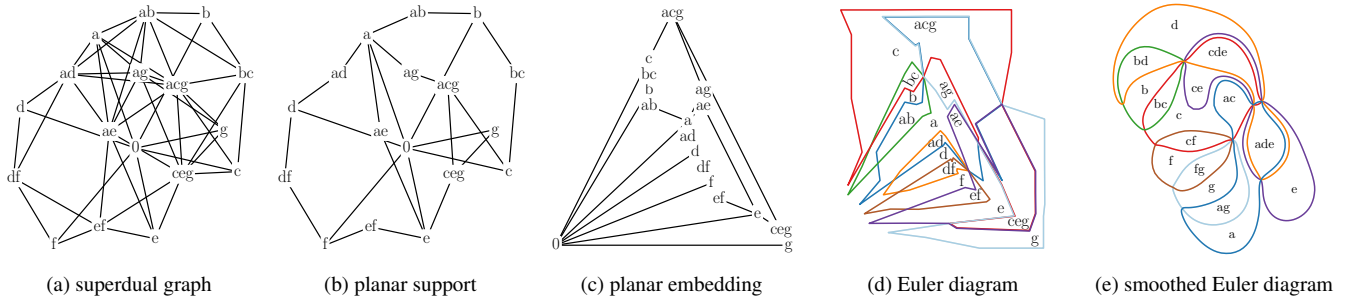


Figure I: Euler diagram of the set system corresponding to the director Art Camacho from MovieDB.

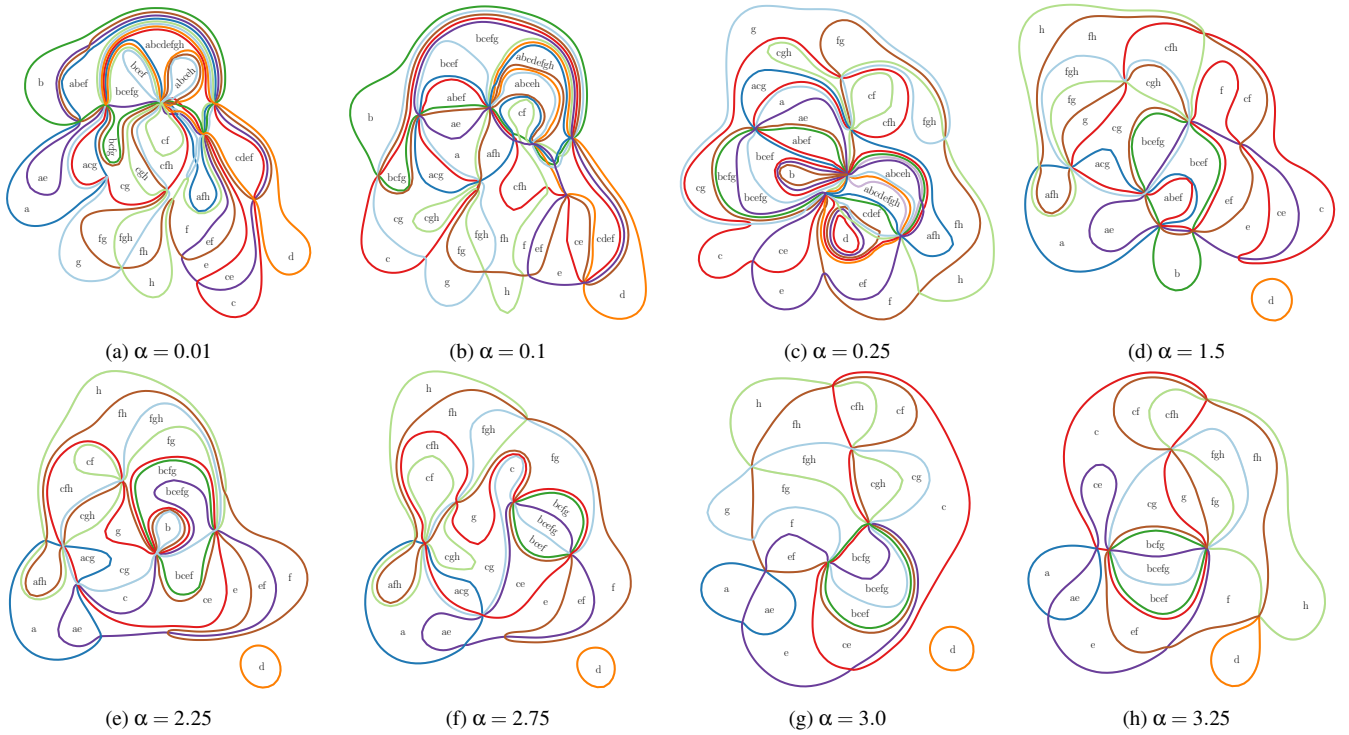


Figure II: Influence of parameter α on the set system corresponding to the director Leigh Slawner from MovieDB. Parameter β is fixed to 0.1 for all results.

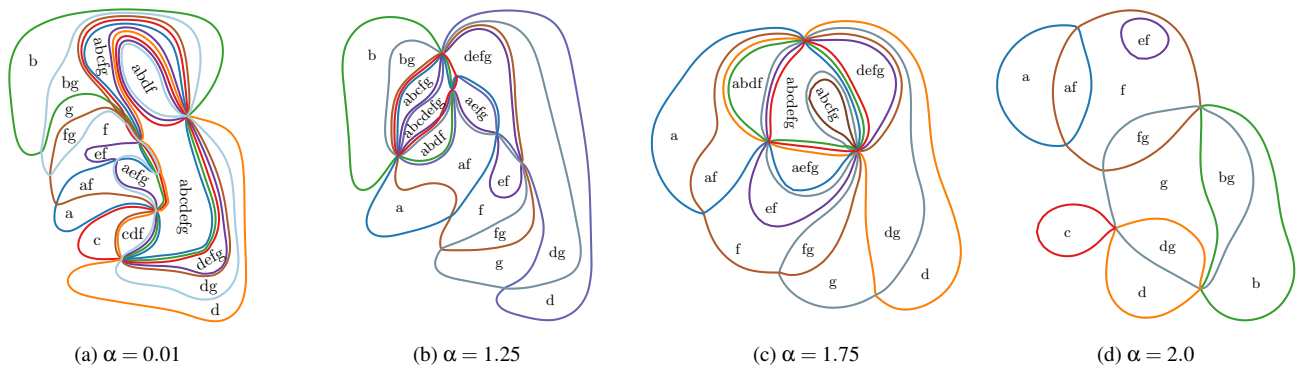


Figure III: Influence of parameter α on the set system corresponding to the director Joel Schoenbach from MovieDB. Parameter β is fixed to 0.1 for all results.

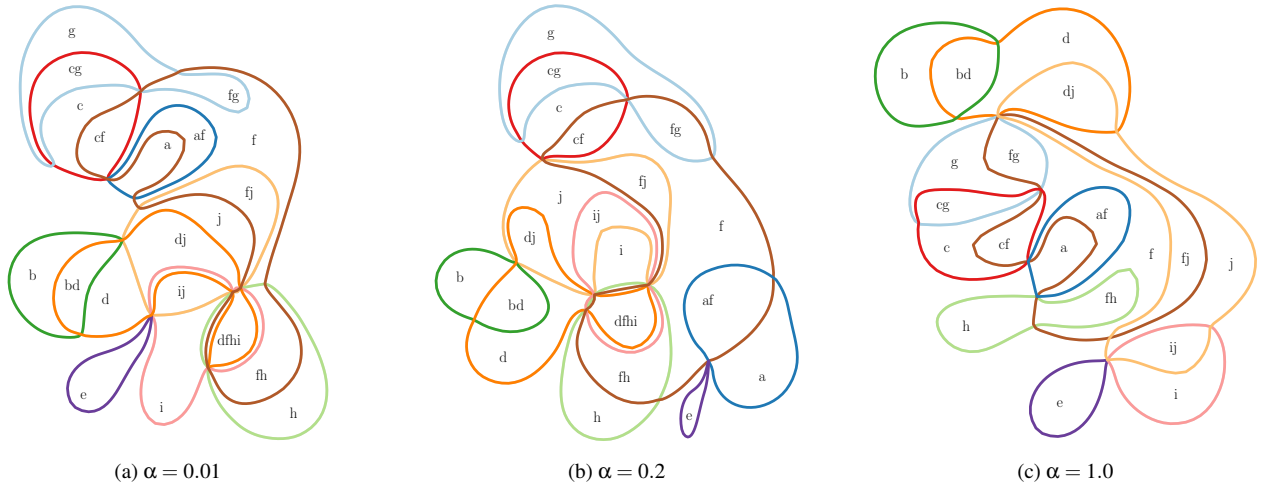


Figure IV: Influence of parameter α on the set system corresponding to the director Jim Wynorski from MovieDB. Parameter β is fixed to 0.1 for all results.

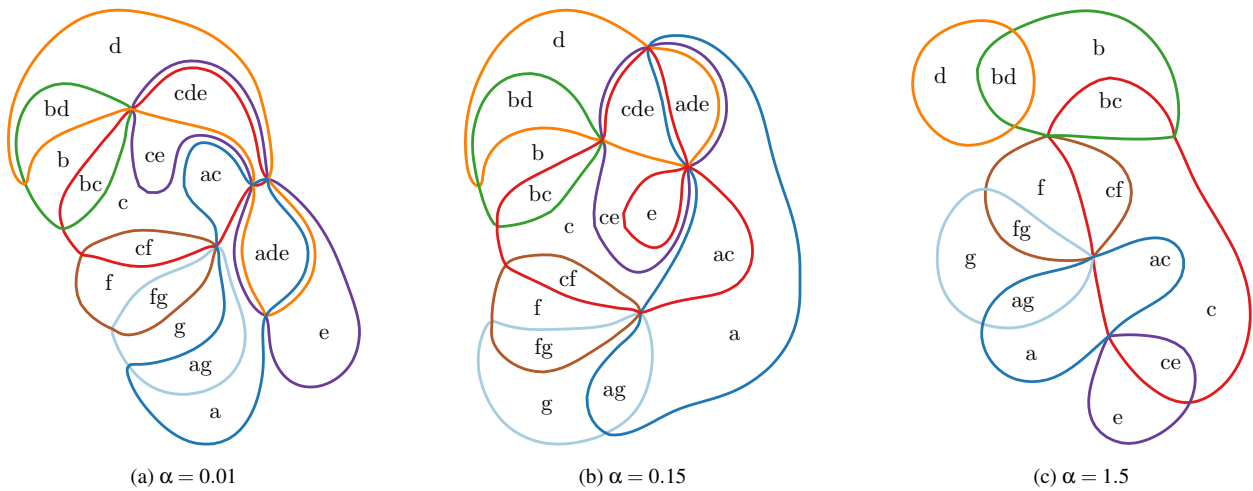


Figure V: Influence of parameter α on the set system corresponding to the director Art Camacho from MovieDB. Parameter β is fixed to 0.1 for all results.

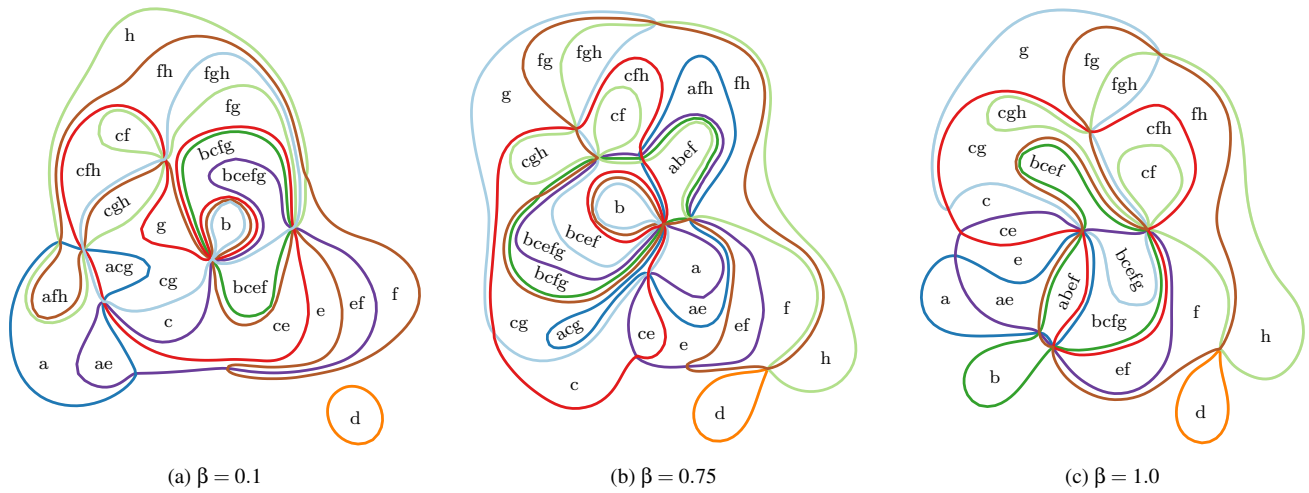


Figure VI: Influence of parameter β on the set system corresponding to the director Leigh Slawner from MovieDB. Parameter α is fixed to 2.25 for all results.