Math 199 Project Proposal

Kris Torres

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Project Outline

Week 2

Create a Ferrers diagram window in Qt that uses DeSalvo's integer partition library as the engine.

Week 3

Dot manipulations, part 1 (micro, individual dots). Design a class around a Ferrers diagram that will allow the user to change the colors, locations, etc. of a default set of dots corresponding to an integer partition.

Week 4

Dot manipulations, part 2 (macro, collections of dots). Apply the micro manipulations to collections of dots by defining iterators of an appropriate type and using algorithms from the STL.

Week 5

Dot manipulations, part 3 (connecting with Pak's paper). Encode each of the geometric/arithmetic transformations contained in Pak's paper so that the procedures can be copied verbatim. Focus mainly on transformations that do not split or paste together multiple diagrams.

Week 6

Sequences of transformations. Pick a couple of simple bijections between partitions, such as a fishhook or another even/odd bijection, and create a function that accepts as input a partition and outputs another partition after the appropriate transformations have been performed. The program will output each step of the transformation so that it can be tracked and understood.

Week 7

Interface the application so that a partition can be input, or a random partition generated, etc.

Week 8

Very large random partitions and connections with limit shapes. Start writing for a conference proceedings in applied computer science.

Week 9

Prepare the work for a conference proceedings in a computer science/computational math conference, to be decided later.