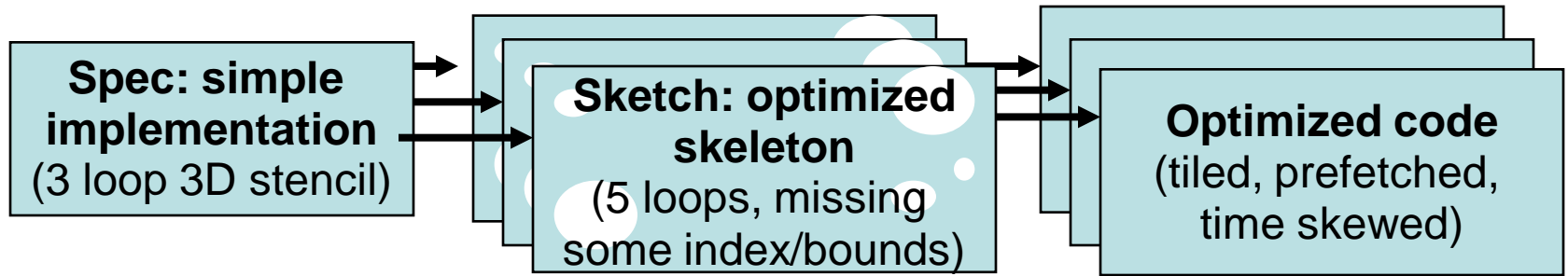
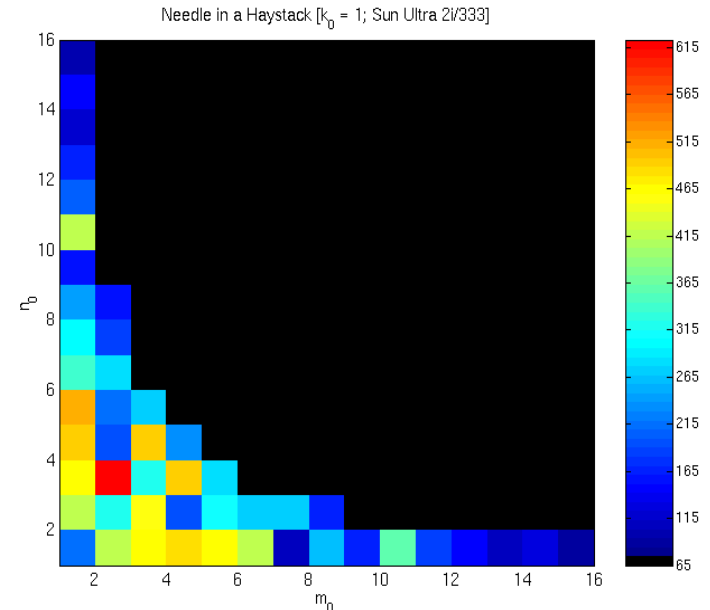


# Program Synthesis

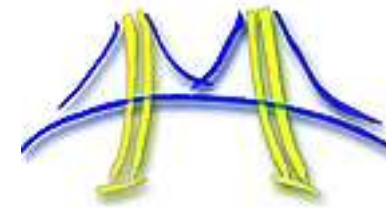
- Best implementation/data structure hard to write, identify
  - Don't do this by hand
- Sketching: code generation using 2QBF



- Autotuning
  - Search large collection of algorithms/data structures
  - Used for linear algebra, FFTs

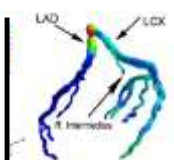


# Dwarf Popularity (Red Hot → Blue Cool)



- How do compelling apps relate to 13 dwarfs?

	Embed	SPEC	DB	Games	ML	HPC	Health	Image	Speech	Music
Finite State Mach.	Red	Red	Red	Yellow	Yellow	Blue	Blue	Blue	Blue	Blue
Combinational	Red	Blue	Green	Blue	Green	Blue	Blue	Blue	Blue	Blue
Graph Traversal	Red	Yellow	Yellow	Yellow	Red	Blue	Red	Blue	Red	Green
Structured Grid	Red	Red	Blue	Yellow	Blue	Red	Blue	Red	Blue	Blue
Dense Matrix	Red	Red	Yellow	Red	Red	Red	Blue	Red	Red	Red
Sparse Matrix	Yellow	Yellow	Blue	Red	Red	Red	Red	Blue	Blue	Red
Spectral (FFT)	Yellow	Blue	Blue	Yellow	Yellow	Red	Blue	Green	Red	Red
Dynamic Prog	Yellow	Blue	Red	Blue	Red	Blue	Blue	Blue	Yellow	Yellow
N-Body	Blue	Yellow	Blue	Yellow	Blue	Red	Blue	Blue	Blue	Blue
MapReduce	Blue	Green	Red	Blue	Red	Red	Blue	Red	Yellow	Red
Backtrack/ B&B	Blue	Blue	Yellow	Blue	Red	Blue	Blue	Blue	Blue	Yellow
Graphical Models	Blue	Blue	Yellow	Blue	Red	Blue	Blue	Blue	Blue	Red
Unstructured Grid	Blue	Blue	Blue	Yellow	Yellow	Red	Red	Blue	Blue	Red



QuickTime™ and a TIFF (LZW) decompressor are needed to see this picture.

