

### **Dynamo: A Transparent Dynamic Optimization System:**

- What is being improved and how is it being improved?
- This is a runtime optimization implemented in software.
- Dynamo generates optimized code for “hot” regions and caches those regions in the fragment cache
- What benefits are obtained by executing the code from the fragment cache?
- What is stored in the fragment cache?

### **The Filter Cache: An Energy Efficient Memory Structure**

- What is the goal of the filter cache? What is being optimized?
- Be able to draw a block diagram of the system. How is it different from a typical system with a cache? How does it change the hit time to the L1 cache?
- How does the filter cache trade lower power consumption for increased performance?
- Is this a hardware or software optimization?
- How is the hit time to the L1 cache changed when the filter cache is added?
- Why is the filter cache so effective given that it is very small compared to a much larger

### **Evaluation of a High Performance Code Compression Method**

- What is the goal of code compression? Reduced program memory size
- What are the overheads involved with code compression?
- When/where is the code decompressed? How does this effect miss penalty and why?
- What issues or bottlenecks did this paper discuss (there were 2 issues)
- What solutions did they give for the bottlenecks? (1 issue had 2 solutions, the other only had 1)
- How does code compression effect the “critical word first” cache optimization?
- When an instruction needs to be fetched from a compressed memory block, why is it difficult to determine where the instruction is within the compressed block?

### **Cache Configuration Exploration on Prototyping Platforms**

- What two system aspects are being optimized? – performance and energy. How are they optimized? – by changing the cache configuration. Why does changing the configuration save power and/or energy? Why is there a trade off between power and energy?
- What is the benefit of a prototyping platform? How does this differ from a simulation-based environment
- What are pareto optimal points? Give a graph, show which points are pareto optimal. Why are pareto optimal points important when you have an optimization that trades off power and energy?

### **Profile Guided Code Positioning**

- Code positioning is the same as code reordering
- What is code reordering? What is its goal? What does it optimize?
- How does code reordering improve cache utilization?
- Discuss the process for applying code reordering to an application
- How is code reordering similar to a trace cache?

### **A First Look at the Interplay of Code Reordering and Configurable Caches**

- How do these two optimizations effect each other and why is exploring their interaction interesting?
-