Putting TM Transactions Back Into Database

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What we are good at

• In-memory transactions:
  – Software (STM)
  – Hardware (HTM)
What (looks like) we are very good at

• Very Efficient Concurrent Data Structures:
  
  …

  – PTO [SPAA ’15]
  – COP [OPODIS ’15]
  – A Speculation-Friendly Binary Search Tree [PPoPP’08]
  
  …
Composability

...and now we have efficient mechanisms for composing multiple data structure operations into a single atomic execution

– ParT [PPoPP’15]
– OTB [PPoPP’14]
– Transactional Boosting [PPoPP’08]

```
Shared data: Tree
atomicFoo()
{
    Tree.add(x);
    Tree.add(y);
}
```
Don’t replace the DBMS, change it

Composable Data Structures

• Use our efficient data structures to implement fast indexes
• Use composability to execute transactions on them