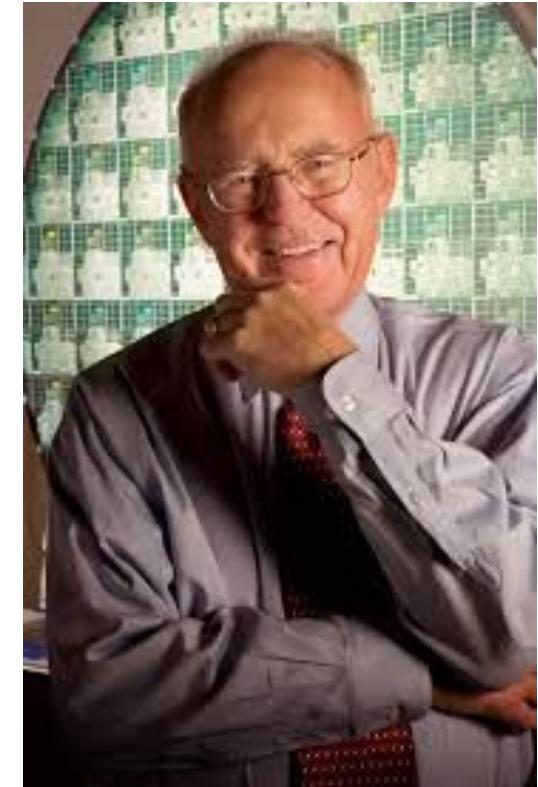


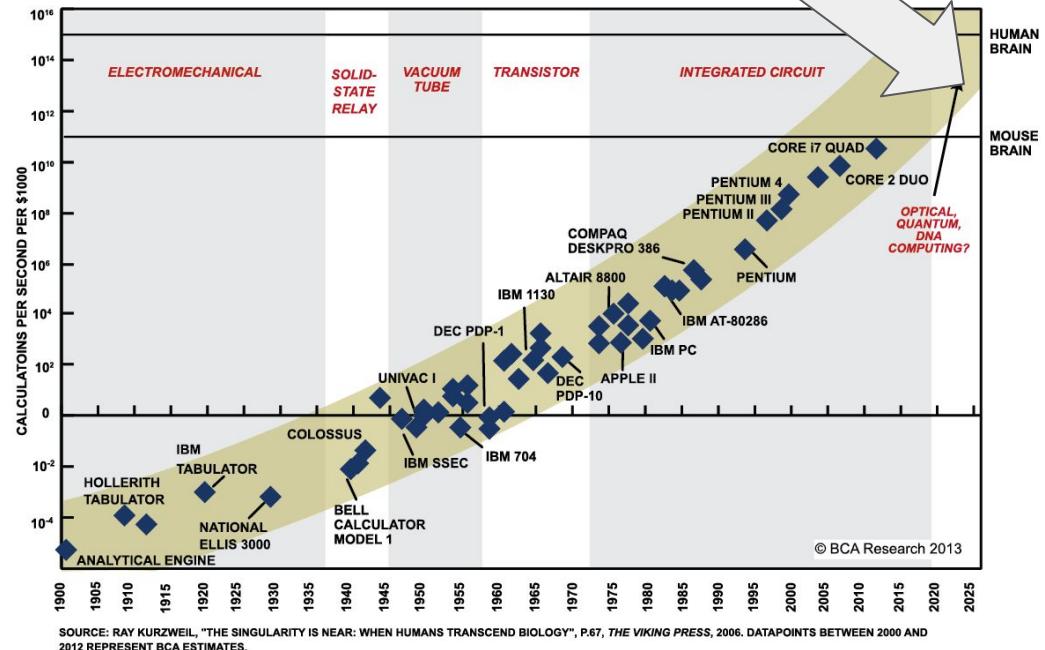
Towards a cat-based computational platform

Pjakkur Helgscat Depill Helgscat
Scotch Kaufmann Whiskey Kaufmann
Max Zhang Pixel Zhang Minion Zhang

Moore's Law is dead!



Cat Brain



We must use new computational platforms



GPU



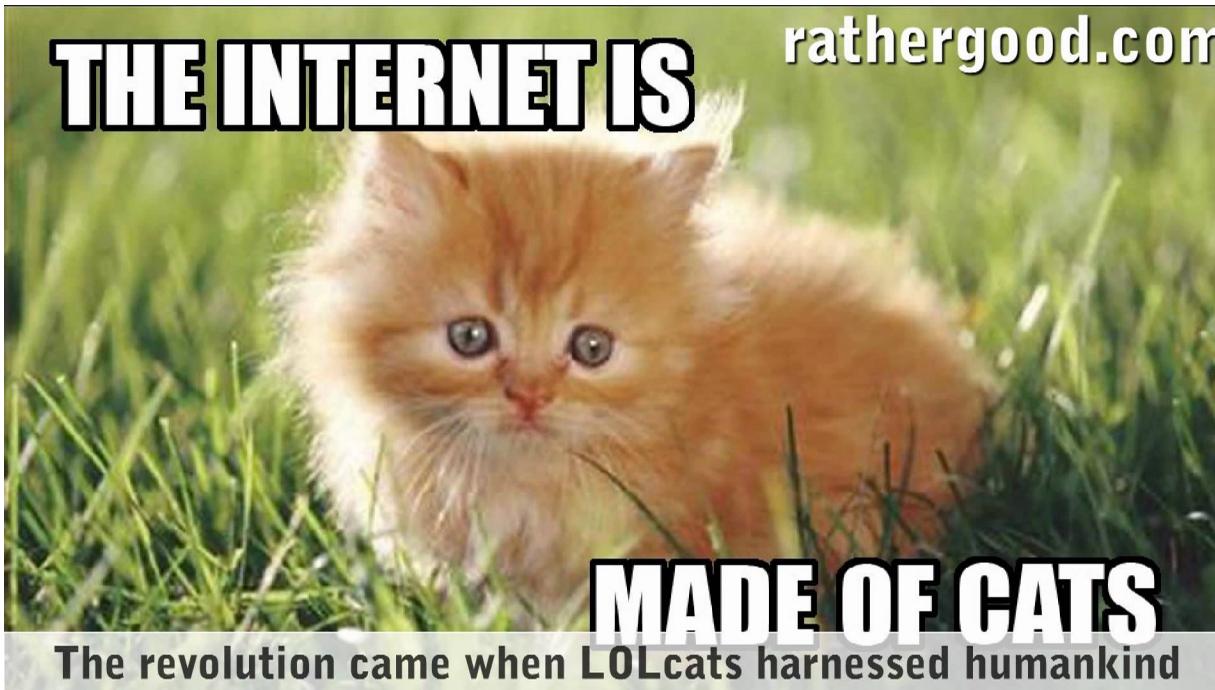
Programmable devices



Cats

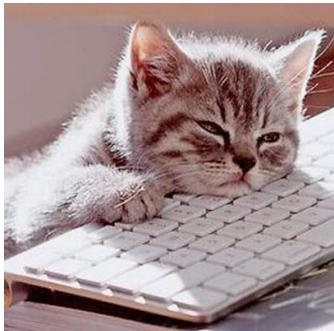
Advantages of Cat-based Computation

Optimized for internet meme workloads



Advantages of Cat-based Computation

Energy-efficient: supports multiple sleep states



Advantages of Cat-based Computation

Speedup: Able to support bursts of high energy



Advantages of Cat-based Computation

Good at cat-recognition tasks



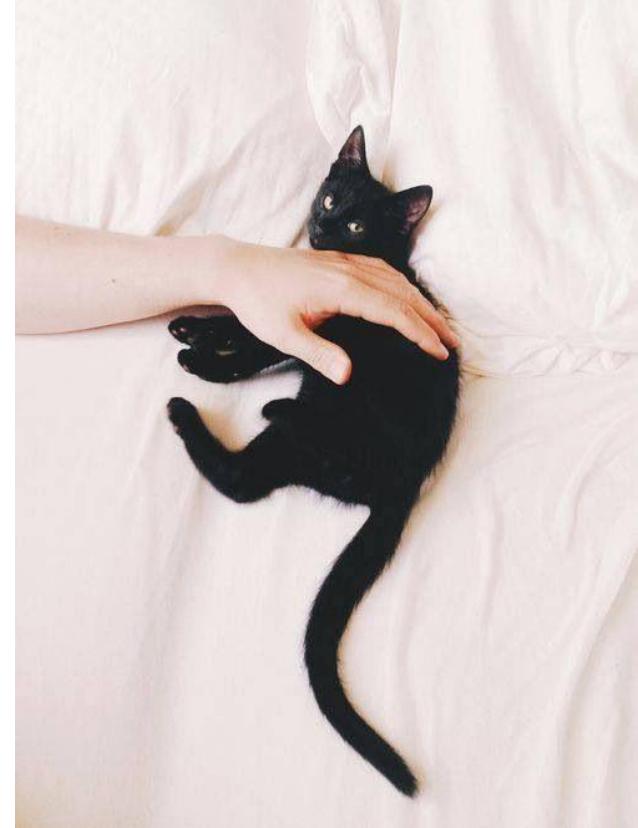
Challenges

Problems managing multi-threaded applications



Challenges

Long tail latency



Challenges

Requires periodic
litter collection



Rest of this talk

- Operating systems and language runtimes
 - Hide the complexity of interfacing with cats
- Distributed Systems
 - Hide cat failures and unavailability
- Verification
 - Prove programs executed by cats are correct
- Evaluation

Cats are extremely heterogeneous



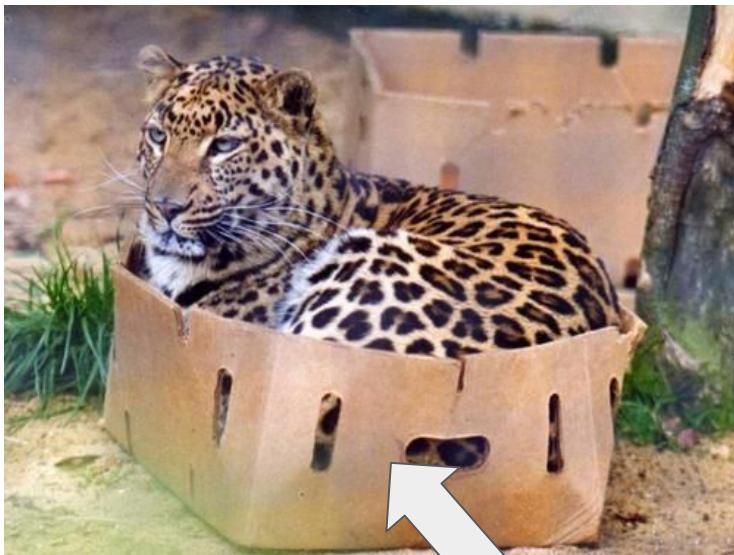
Some are high-performance



While others are more limited



Programming platforms hide cats from programmers



Programming Platform



Cloud providers are increasingly deploying their own platforms



Rest of this talk

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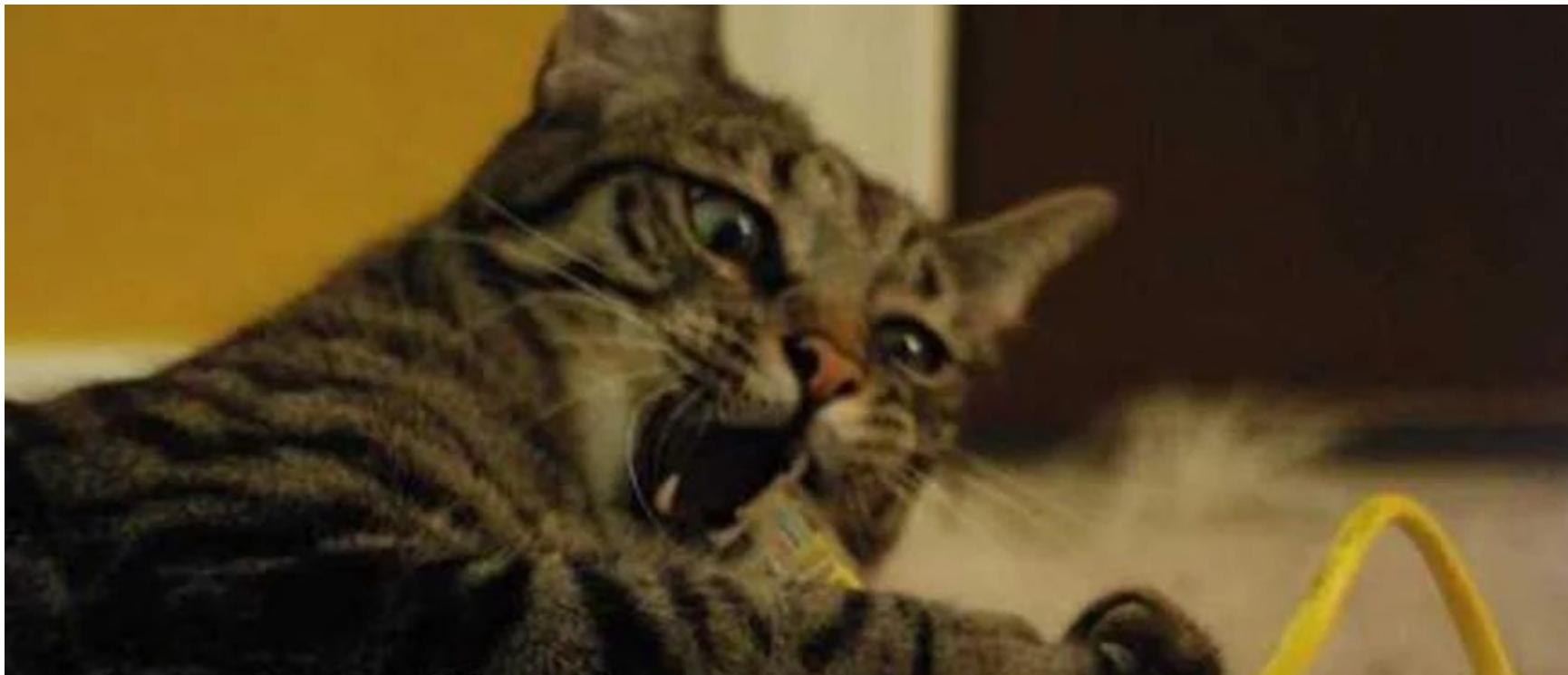
Replication

- Cats are unreliable



- Replication can mask many types of cat failures

Networking



Types of Replication

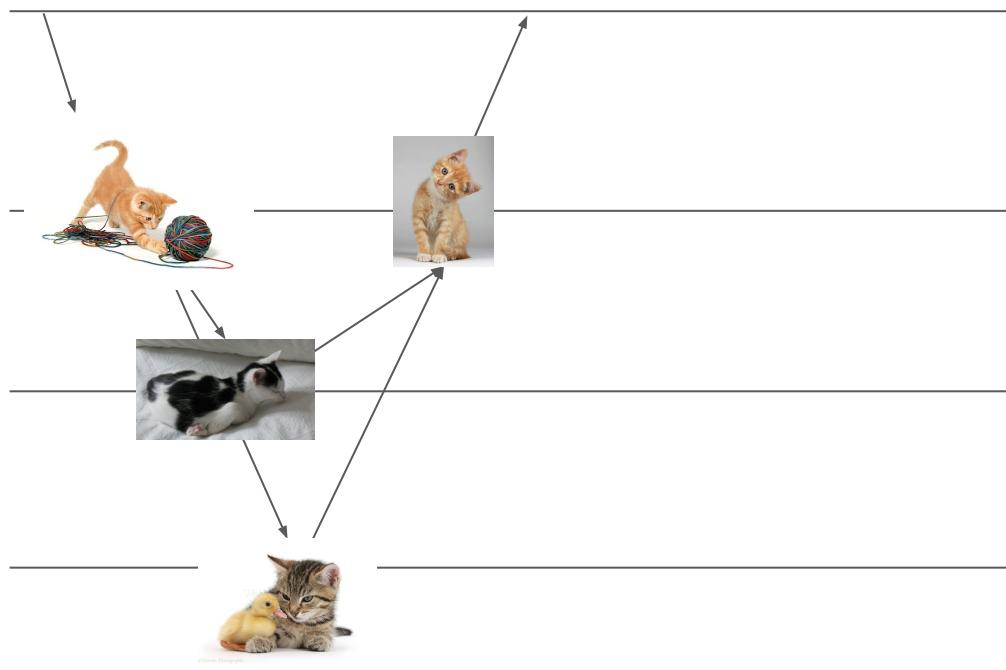


Primary-Backup



Consensus-based

Paxos



Inefficient!

High Latency!

Processes
1 operation/day!

Rest of this talk

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Verification

- Frequent undefined behavior can cause breakage



Verification

Amenable to verifying using boolean satisfiability solvers



Verification

Also supports Coq

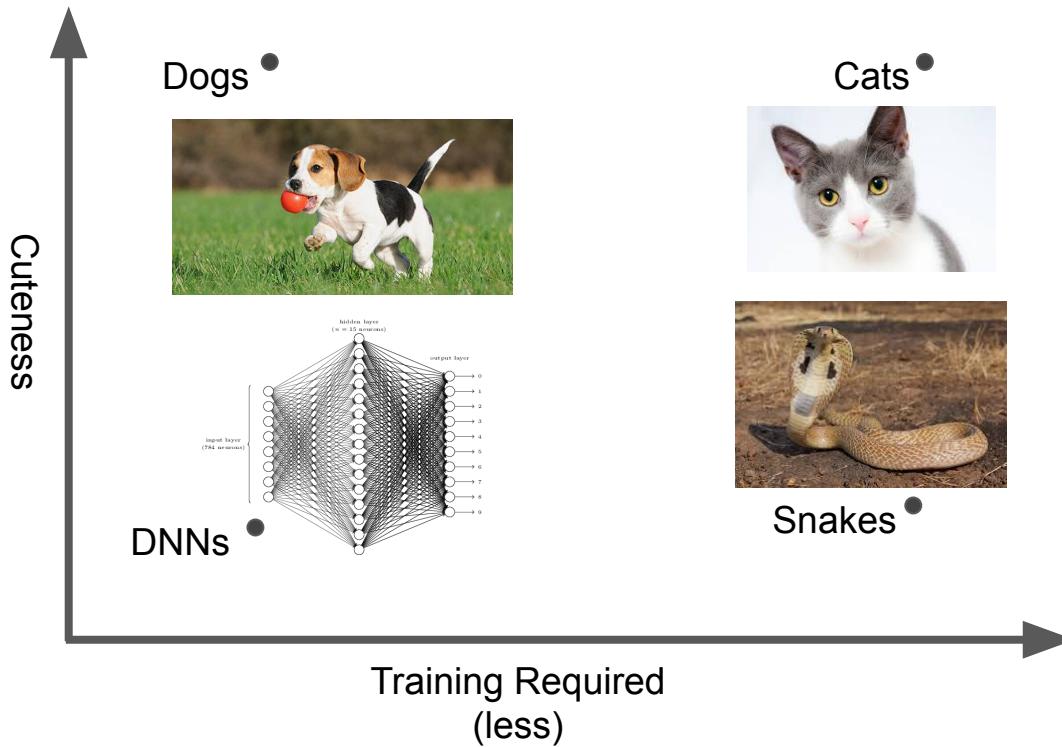


Verification

Or use cat as proof assistant



Evaluation



Future work & Collaborations

HCI (Human-Cat Interaction)



Security and Privacy



Robotics



Related work



Gerbil
Meets
Mouse
PUBLISHING