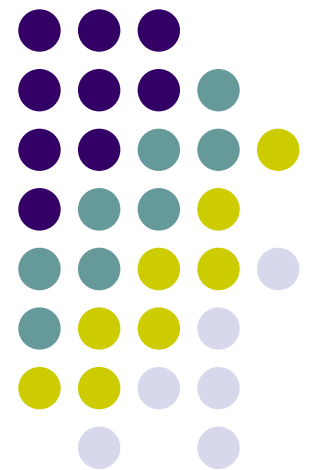


# Autonomous ROI Analysis of Additional Processing Resources

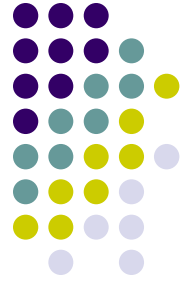
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Balancing the cost of using  
additional resources with the  
value received

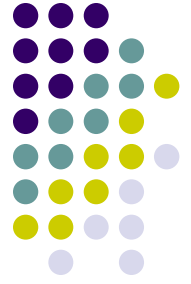
*Jonathan Wildstrom, Peter Stone, and Emmett Witchel  
The University of Texas at Austin*



# General Idea

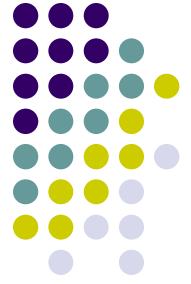


- Virtualization allows multiple logical **subsystems** to exist on a single piece of hardware
  - Resources are assigned to only one subsystem, or may be unused
  - Resources have a cost (e.g. power) to use
- A **distributed system** can use this virtualization
  - This allows **isolation of the components** while saving on hardware
- The workload can **change without warning**
  - The system needs to **adapt** by increasing or decreasing resources



# Our approach

- Estimate **value** of more resources
  - In our case, **processing power**
- Balance “**profit**” from more resources with cost
  - Want a net gain
  - Equivalent consideration for disabling resources
- We’d like an **autonomous agent** to do this for us
  - Constantly rebalancing resources
  - Faster analysis than an administrator



# Results

- **Autonomous ROI analysis** can help maximize gain from a system as a whole
- **Machine learning** can estimate ROI for processing power
  - By predicting **value** of more or less CPU