Parrotfish:
Parametric Regression for Optimizing Serverless Functions

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THE UNIVERSITY OF BRITISH COLUMBIA

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Rightsizing Serverless Functions

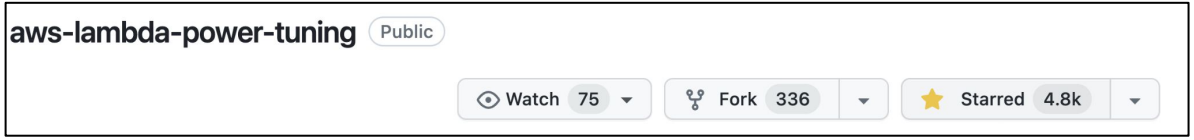
- AWS Lambda:

  *Cost = Request Cost + **Execution Time (s) ✕ Memory (MB)** ✕ Duration Cost (1/MB.s)*

- Manual
- Automated Sweep
  - AWS Lambda Power Tuning
- Learning and Optimization
  - Black-box approach


10 ways to reduce your AWS Lambda costs

14 July 2021 Szymon Tags: AWS, serverless Comments: 0


aws-lambda-power-tuning Public

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Sizeless: Predicting the Optimal Size of Serverless Functions

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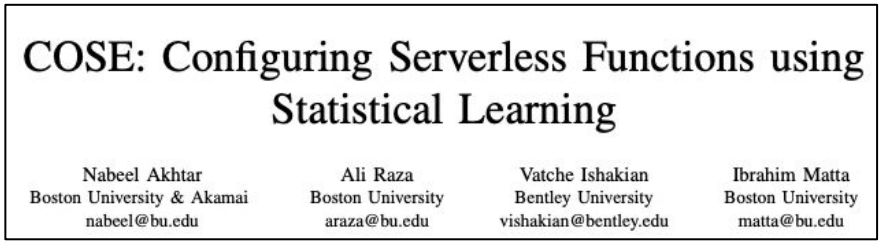
COSE: Configuring Serverless Functions using Statistical Learning

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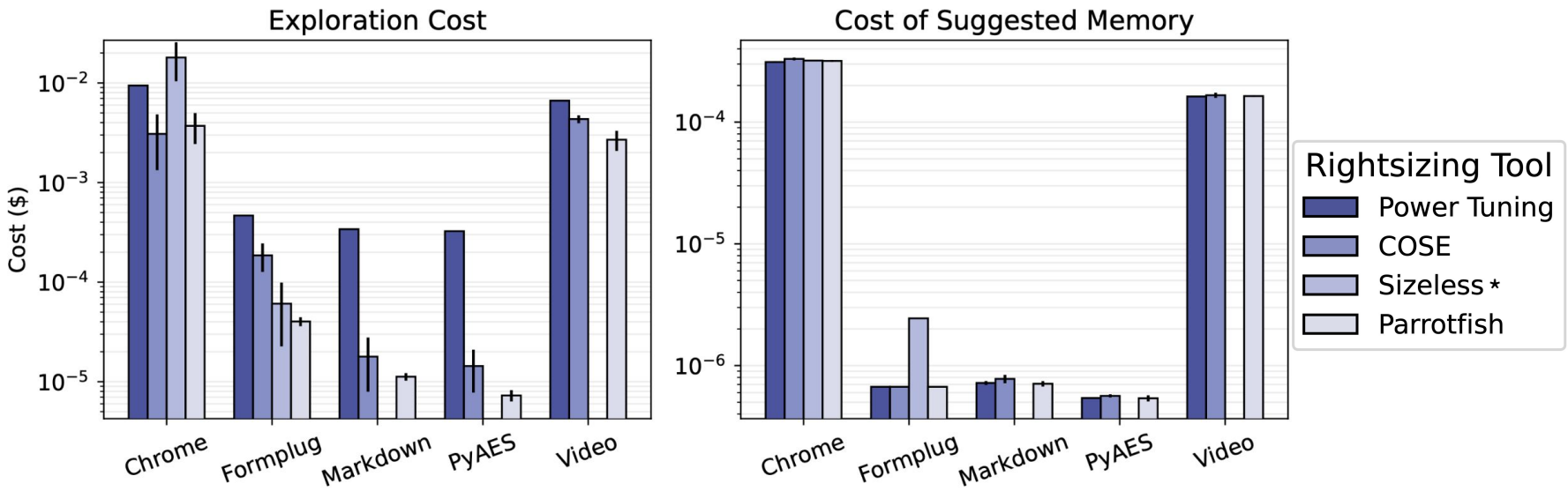
Modeling Serverless Functions

- Knowing a common underlying behavior, per-function performance models can be fit robustly with few samples (Parametric Regression).
- Fitted more than 170 mathematical functions to all the samples
  - Polynomial: quadratic, cubic, …
  - Exponential: exponential decay, exponential growth
  - etc.

Fit	Chrome	Formplug	Image	Java-S3	M2H	PyAES	Video
Best	Poly	Exp	Exp	Exp	Exp	Exp	Poly
2nd	Exp	Poly	Log	Log	Poly	Poly	Exp
3rd	Asymp	Asymp	Poly	Asymp	Asymp	Asymp	Recip
4th	Recip	Log	Asymp	Poly	Recip	Recip	Asymp
5th	Log	Recip	Recip	Recip	Log	Log	Log

Does it actually work?

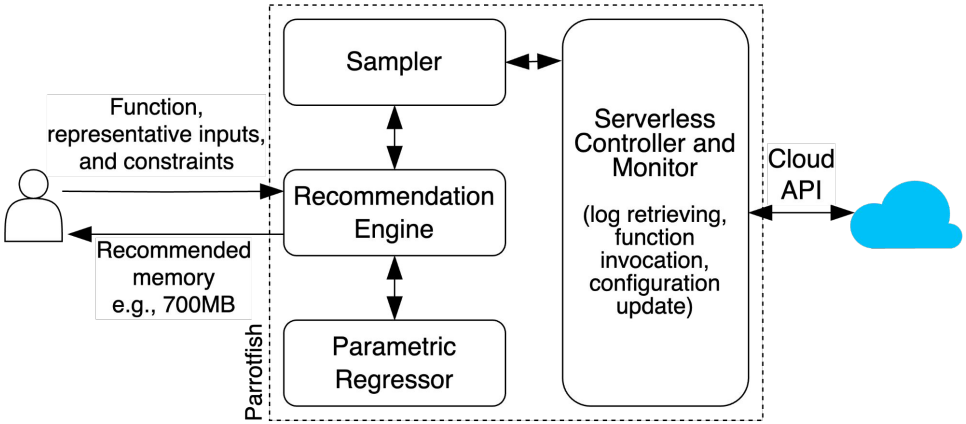
- **1.81x-9.96x** reduction in exploration cost compared to state of the art tools
- **25.74%** reduction in cost of suggested memory, on average

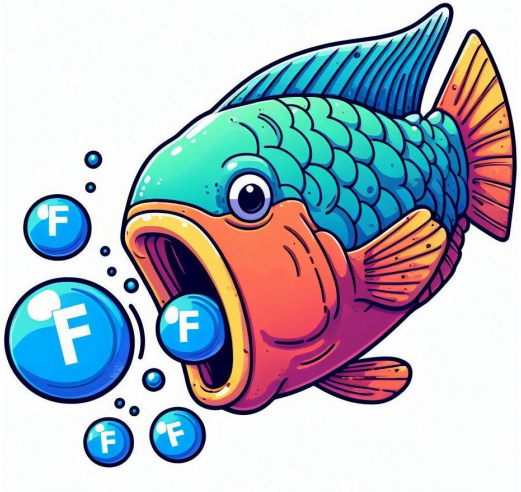


* Sizeless only supports NodeJS functions.

Parrotfish

- Parrotfish enables low-cost rightsizing for serverless functions.
- It supports rich objectives, handles multiple inputs, and supports various clouds.
- **3.65x** reduction in exploration and **25.74%** reduction in suggested config cost





https://github.com/ubc-cirrus-lab/parrotfish