Parrotfish:
An Advanced Multi-Objective Serverless Rightsizing Tool

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Rightsizing Serverless Functions

- Serverless pricing model (e.g., AWS Lambda):

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

10 ways to reduce your AWS Lambda costs

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

How We Reduced Lambda Functions Costs by Thousands of Dollars

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- Existing approaches:

  - Manual sweep

  - Automated sweep (e.g., AWS Lambda Power Tuning)

 - Black-Box Learning and Optimization

Modeling Serverless Functions

- Knowing a common underlying behavior, per-function performance models can be fit robustly with few samples (Parametric Regression).

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

Parametric Regression is Beneficial

- **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
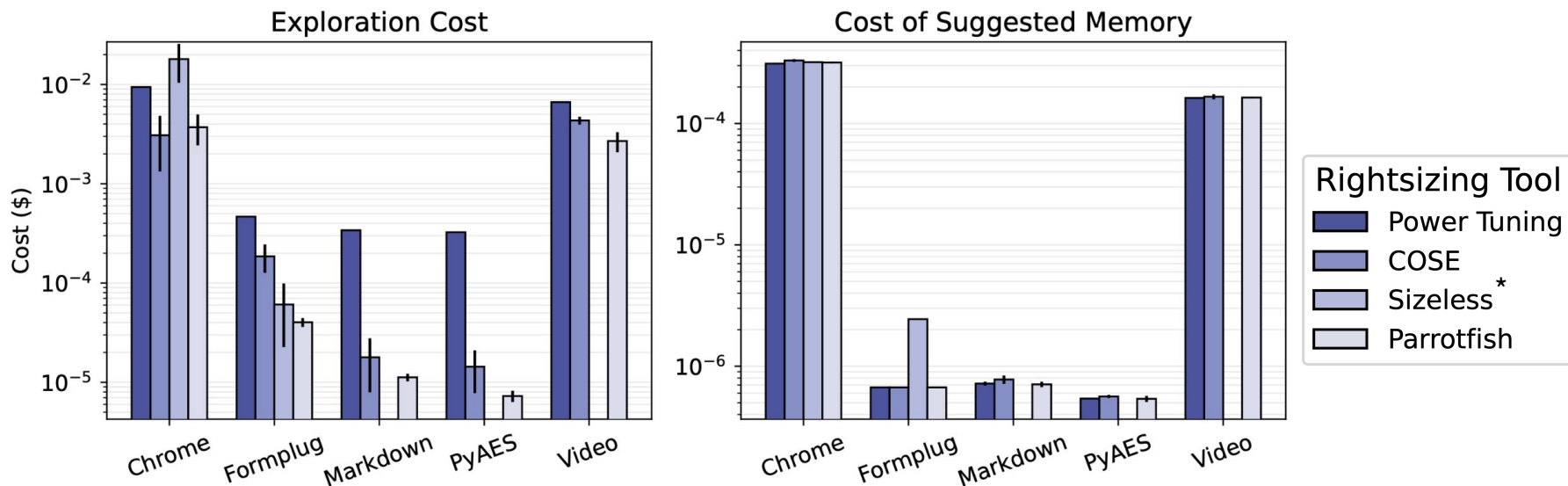
* Sizeless only supports NodeJS functions.

Parrotfish

- Target users: developers, cloud providers, and researchers
- Currently supports AWS Lambda and GCP Functions
  - Modular design to add support for other cloud platforms
- Supports rich objectives, handles multiple inputs, and supports various clouds.

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A. Moghimi et. al., 2023. Parrotfish: Parametric Regression for Optimizing Serverless Functions.
In Proceedings of the 2023 ACM Symposium on Cloud Computing (SoCC '23)