

## Layer-Aware Containerized Service Orchestration in Edge Networks

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### Abstract

Edge computing provides computational resources in the vicinity of end-users to reduce delay compared to traditional remote clouds. However, the capacity of edge resources usually is not sufficient for the required computational demands. Therefore, it is necessary to design methods for employing these resources in an efficient manner. On the other hand, network function virtualization (NFV) is a promising solution to use the network resources in a more flexible way than traditional schemes. Although more focus has been on realization of NFV systems via virtual machines (VMs) so far, recent studies show that container-based solutions can improve efficiency thanks to their lightweight implementation and layered structure.

In this talk, we consider the scenario where an edge network is realized on top of a containerized NFV system and service requests are submitted to it by the customers. We address important aspects of this problem such as downloading and sharing container layers and steering traffic among network functions. We present the formulation of the problem as an integer linear program (ILP). Then, to handle this problem, we propose a polynomial-time algorithm based on ideas from deterministic and randomized rounding framework. Finally, our results from extensive evaluations show considerable performance of the proposed algorithms in terms of various metrics such as bandwidth consumption compared to the optimal algorithm and baselines from literature.

### Biography

Seyed Hamed Rastegar is a Postdoctoral Researcher at the School of Computer Science, Institute for Research in Fundamental Sciences (IPM). He received his PhD from the University of Tehran in 2018. His research interests include computer and communication networks, cloud/edge computing, Internet of Things (IoT), and data science.

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