

# MOHAN KUMAR KUMAR

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*Research Scientist*  
*Meta Reality Labs*

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## Education

<b>Georgia Institute of Technology</b>	Ph.D. in Computer Science Specialization: Systems Advisor: Dr. Taesoo Kim	Atlanta, GA
<b>Georgia Institute of Technology</b>	Masters in Computer Science Specialization: Systems	Atlanta, GA
<b>University of Madras</b>	B.E in Computer Science	Chennai, India

## Current Job

I am a research scientist at Meta Reality Labs, where I work on accelerating ML inference on embedded devices. For the past 3 years, the core part of my work is to lower Convolutional Neural Networks (CNN) models that can efficiently run on NPUs/eNPUs. For achieving the above, I implemented the needed kernels using vector intrinsics, implemented the NPU/eNPU back-end delegates in pytorch 2.0, and performed perf/power analysis for all the lowered models. In addition, I worked on developing tools that are needed for profiling concurrent execution of CNN models on these devices. I worked with Qualcomm on the software stack needed for next generation devices, and the support for new programming paradigms (e.g., Triton).

## Work Experience

<b>Research scientist</b>	Facebook Reality Labs (FRL), Burlingame, CA Working in Facebook Reality Labs (FRL) on accelerating CNN ML models that are needed for AR/VR devices.	02/2022–
<b>Research scientist</b>	Facebook Reality Labs (FRL), Menlo Park, CA Working in Facebook Reality Labs (FRL) on a microkernel operating system.	07/2019–02/2022
<b>Software engineering intern</b>	Facebook, Menlo Park, CA Worked in Facebook Infra.	05/2018–08/2018
<b>Research Intern</b>	HP Labs, Palo Alto, CA Worked on RDMA software stack needed for next generation data centers.	05/2015–08/2015
<b>Research Assistant</b>	Georgia Tech, Atlanta, Ga Research in the CERCS under Dr. Ada Gavrilovska and Systems Software & Security Lab under Dr. Taesoo Kim.	05/2014–05/2019

## Teaching Experience

<b>Teaching Assistant</b>	Georgia Tech, Atlanta, Ga Teaching assistant for Advanced Operating Systems(AOS) during Spring 2016	01/2016–05/2016
<b>Teaching Assistant</b>	Georgia Tech, Atlanta, Ga Teaching assistant for Advanced Operating Systems(AOS) during Spring 2018	01/2018–05/2018

## Conference and journal publications

1. **ECOTLB: Eventually Consistent TLBs**  
Steffen Maass\*, **Mohan Kumar**\*, Taesoo Kim, Tushar Krishna, and Abhishek Bhattacharjee.  
In *ACM Transactions on Architecture and Code Optimization (TACO 2020)*,
2. **SOLROS : A Data-Centric Operating System Architecture for Heterogeneous Computing**  
Changwoo Min, Woon-Hak Kang, **Mohan Kumar**, Sanidhya Kashyap, Steffen Maass, Heeseung Jo, and Taesoo Kim.  
In *Proceedings of the 13th ACM European Conference on Computer Systems (EuroSys 2018)*,  
Porto, Portugal, April, 2018.
3. **LATR: Lazy Translation Coherence**  
**Mohan Kumar**\*, Steffen Maass\*, Sanidhya Kashyap, Jan Vesely, Zi Yan, Taesoo Kim, Abhishek Bhattacharjee, and Tushar Krishna.  
In *proceedings of the 23rd ACM International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS 2018)*,  
Williamsburg, VA, USA, March, 2018.
4. **Mosaic: Processing a Trillion-Edge Graph on a Single Machine.**  
Steffen Maass, Changwoo Min, Sanidhya Kashyap, Woonhak Kang, **Mohan Kumar**, and Taesoo Kim.  
In *Proceedings of the 12st ACM European Conference on Computer Systems (EuroSys 2017)*,  
Belgrade, Serbia, April, 2017.  
**Best student paper**
5. **TCP Ordo: The cost of ordered processing in TCP Servers**  
**Mohan kumar** and Ada Gavrilovska.  
In *Proceedings of the IEEE International Conference on Computer Communications (INFOCOM 2016)*,  
San Fransico, CA, April 2016.
6. **S-NFV: Securing NFV states by using SGX.**  
Ming-Wei Shih, **Mohan Kumar**, Taesoo Kim, and Ada Gavrilovska.  
In *Proceedings of the ACM International Workshop on Security in SDN and NFV (SDN-NFV Security 2016)*,  
New Orleans, LA, March, 2016.  
**Best paper and published in NFV congress**

## Posters

1. **mKPAC: Kernel Packet Processing for Manycore Systems**  
Ramneek, **Mohan Kumar**, Taesoo Kim, and Sungin Jung.  
In *Proceedings of the 19th International Middleware Conference (Middleware'18) Poster*  
Rennes, France, December, 2018.
2. **Network Function Fault Isolation in a Single Address Space**  
**Mohan Kumar**, Steffen Maass, and Taesoo Kim.  
In *the 14th USENIX Symposium on Networked Systems Design and Implementation (NSDI'17) Poster*  
Boston, MA, April, 2017.
3. **DistCoz: Tell Me What to Optimize in My Distributed Application**  
Steffen Maass, **Mohan Kumar**, and Taesoo Kim.  
In *the 14th USENIX Symposium on Networked Systems Design and Implementation (NSDI'17) Poster*  
Boston, MA, April, 2017.
4. **VNFStore: NFV State Externalizing Framework**  
**Mohan Kumar** and Ada Gavrilovska.  
In *Diversity Workshop at SOSP'15*, Monterey, CA, October, 2015.

## Awards

<b>Eurosys'17</b>	Best student paper award	04/2017
<b>SDN-NFV'16</b>	Best paper award	03/2016

## Opensource Contributions

<b>Zephyr</b>	Contributions to the Zephyr protocol stack	2022
<b>SLiRP</b>	Bug fix to the SLiRP IPv6 module	2021

## Travel Grants

1.	<b>25th ACM Symposium on Operating Systems Principles</b> Monterey, CA	10/2015
2.	<b>Diversity Workshop at SOSP'15</b> Monterey, CA	10/2015
3.	<b>14th USENIX Symposium on Networked Systems Design and Implementation</b> Boston, MA	03/2017

## Invited Talks and Presentations

<b>Infocomm'14</b>	TCP Ordo: The cost of ordered processing in TCP Servers	04/2016
<b>ASPLOS'18</b>	LATR: Lazy Translation Coherence	03/2018

## Professional Service

<b>USENIX ATC 2020</b>	Program Committee
<b>MLSys 2026</b>	External Program Committee

## Work Authorization

US permanent resident as outstanding researcher.