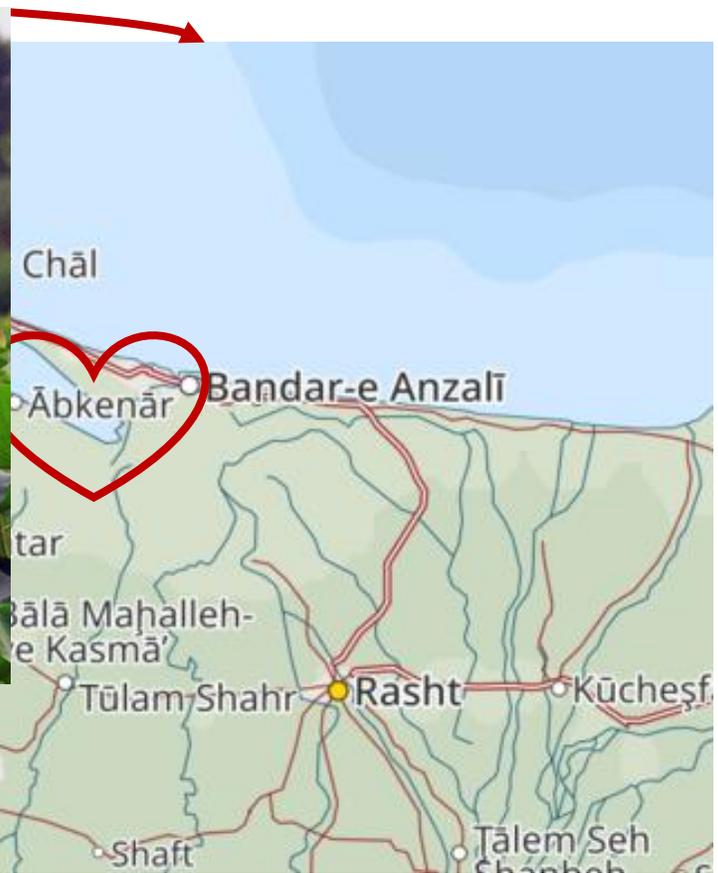


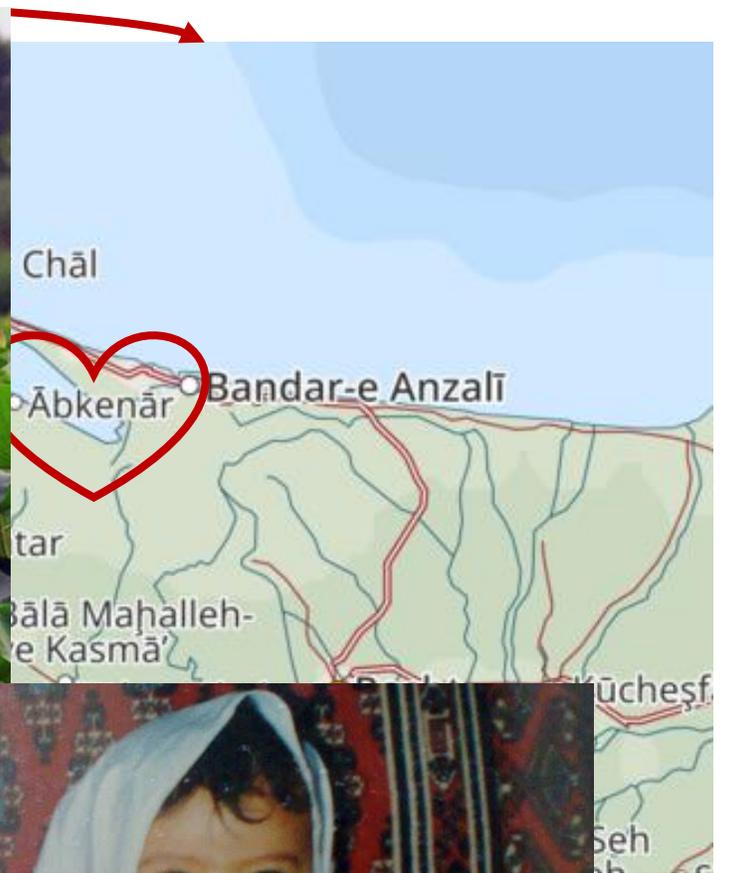


RESEARCH JOURNEY

Forough Shirin Abkenar

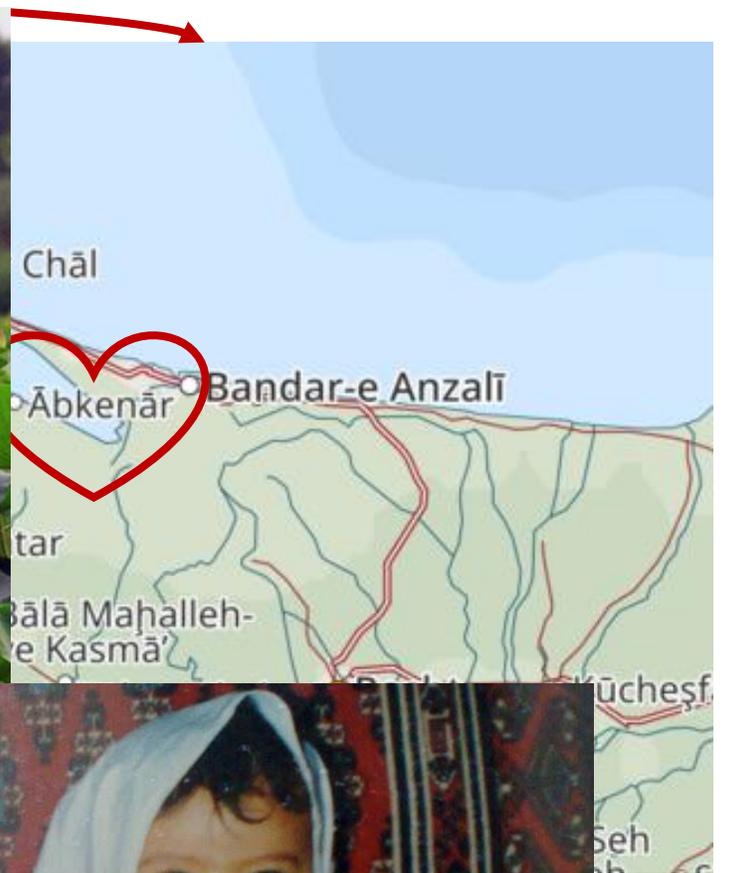








SAUDI ARABIA



SAUDI ARABIA



OMAN

3



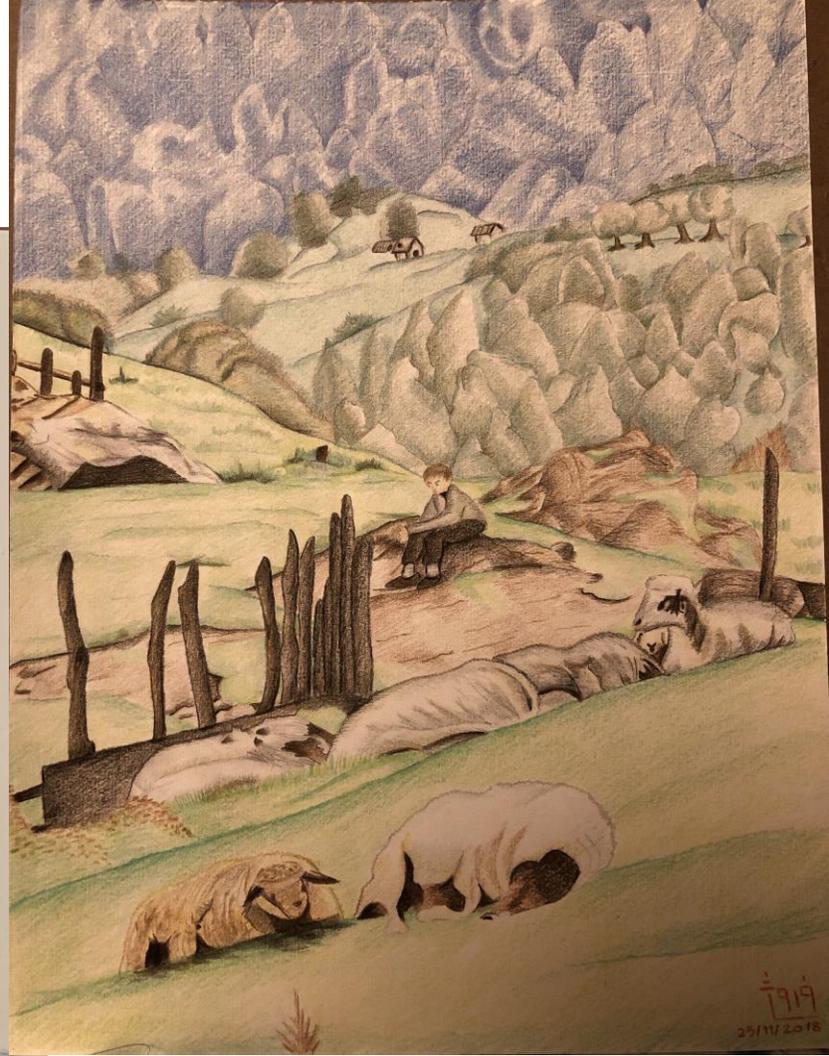


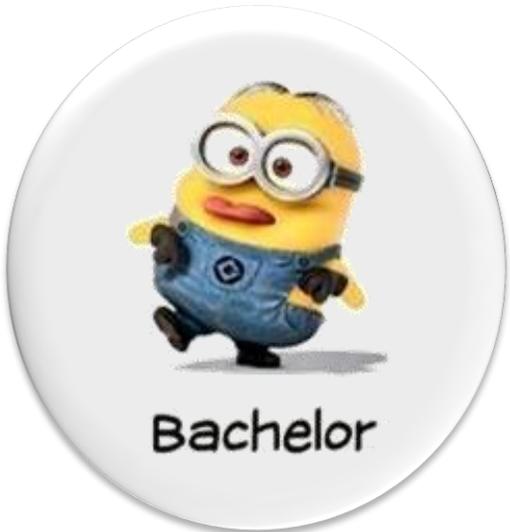


Footprint of Firecrackers



Forough Shirin Abkenar

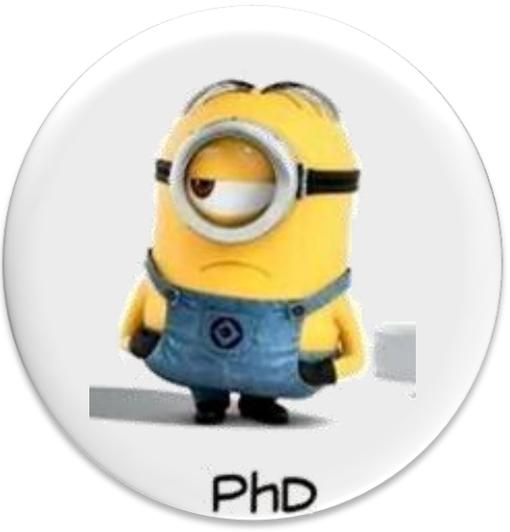




Bachelor



Master

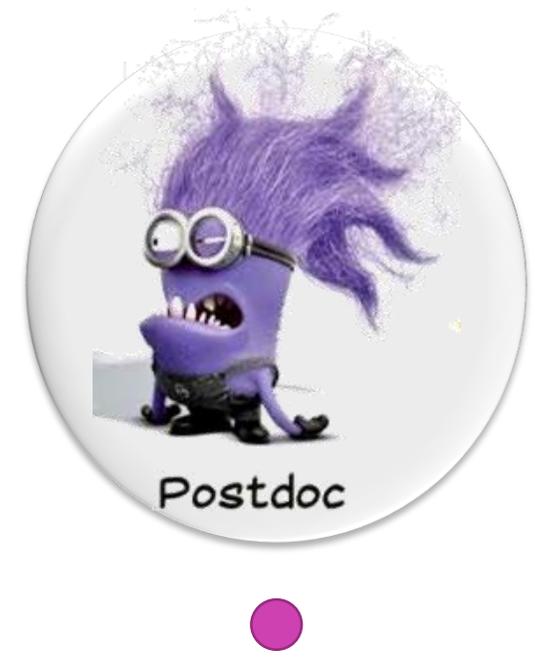
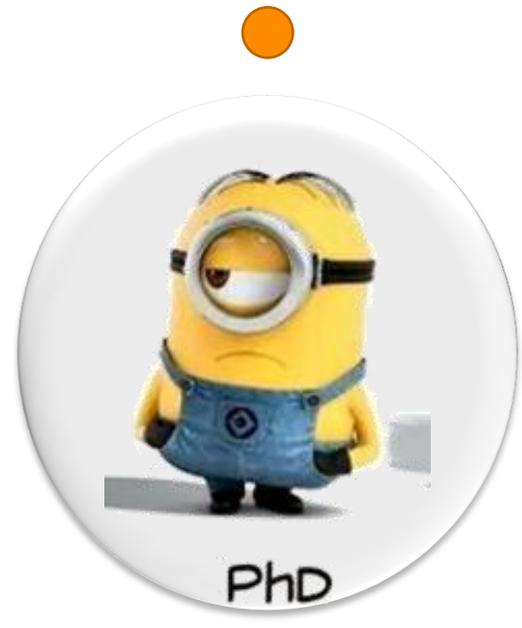


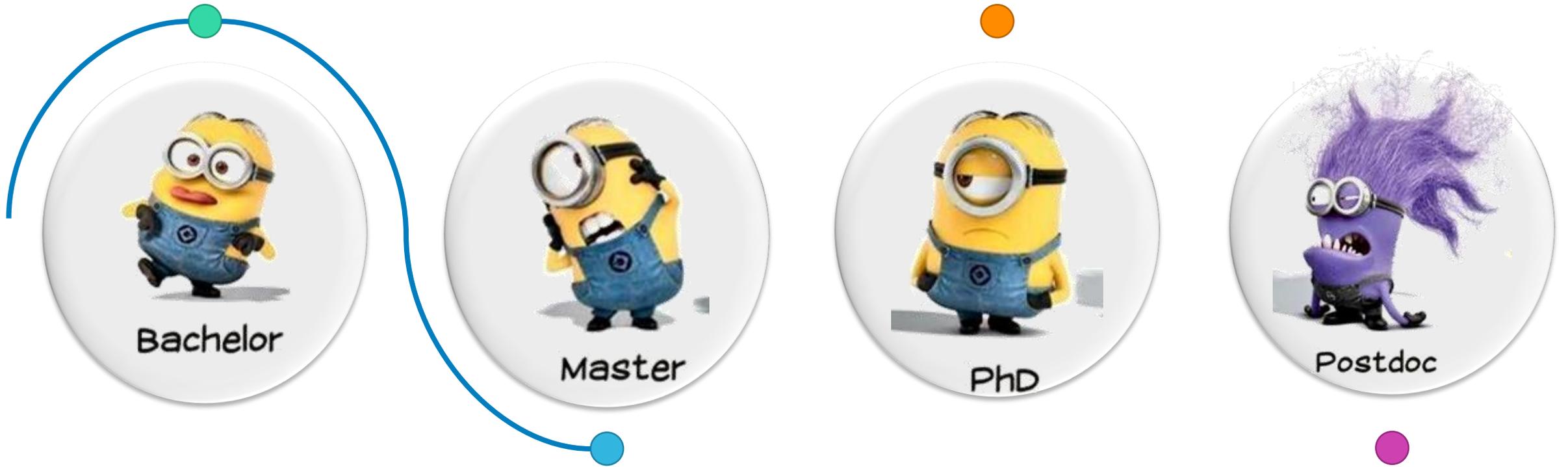
PhD



Postdoc



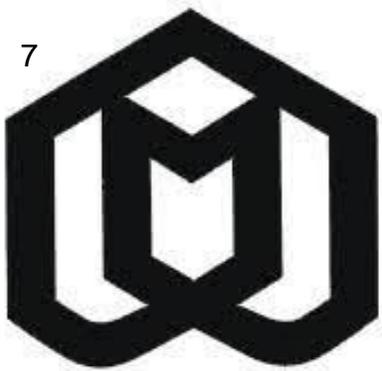








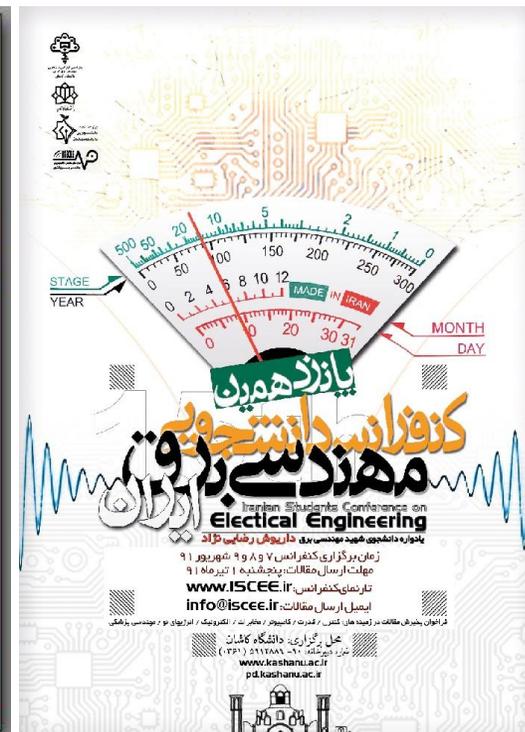
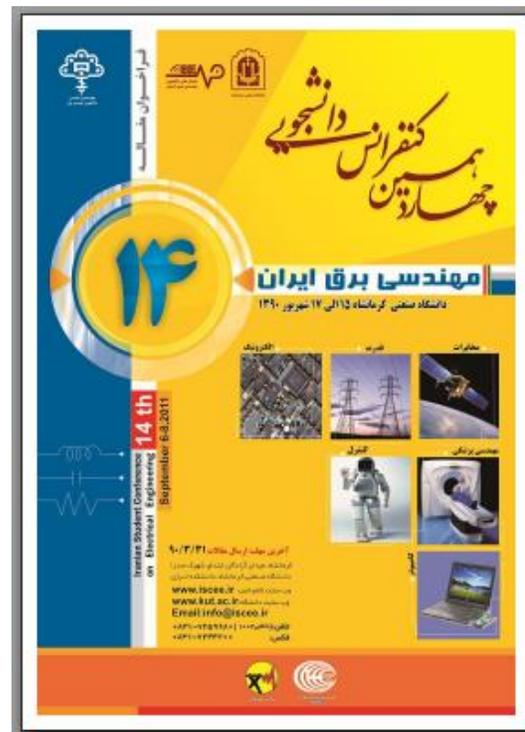
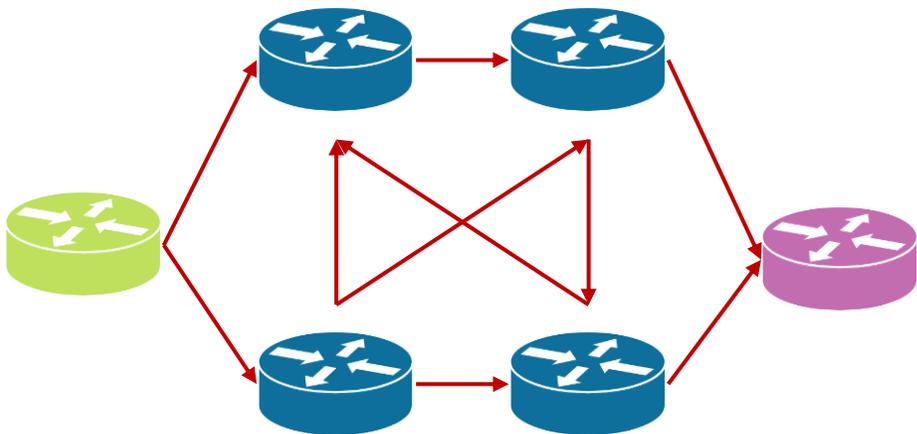




Azarbaijan Shahid Madani University



M. Heydarian and **F. Shirin Abkenar**, "Optimal Multicast Multi Sources Routing in Communication Networks," in *Current Proceeding on Technology*, vol. 1, 2012



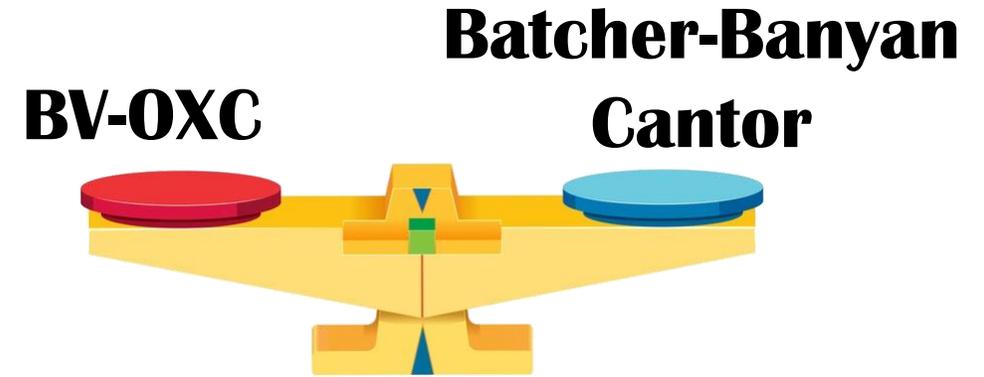


SAHAND UNIVERSITY OF TECHNOLOGY

Elastic Optical Networks (EONs)

Elastic Optical Networks (EONs)

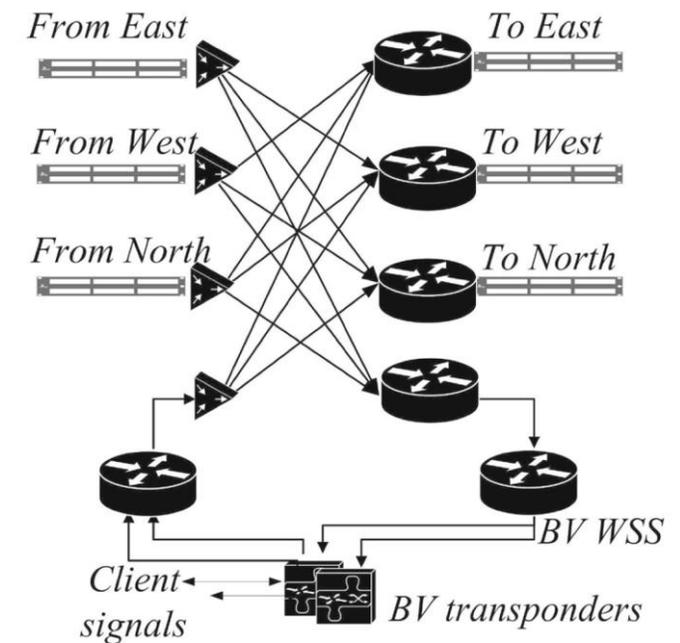
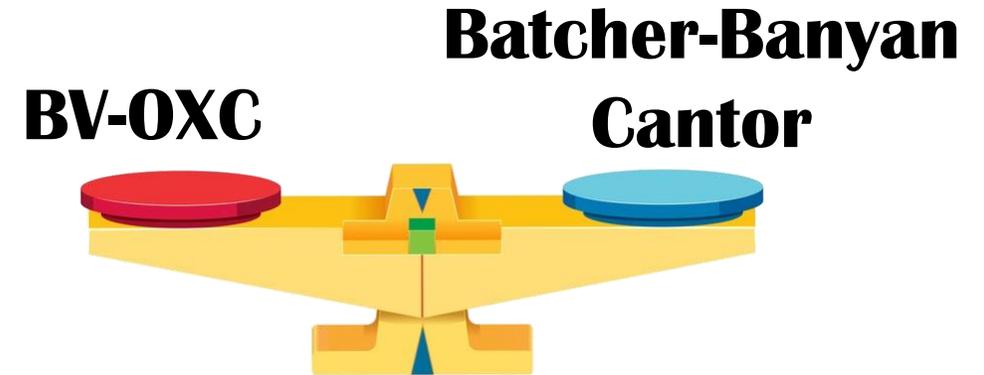
F. Shirin Abkenar, A. G. Rahbar, "Cost Effectiveness of Bandwidth Granularity in Optical Networks," in *Optical Switching and Networking*, vol. 22, pp. 117-128, 2016.



Elastic Optical Networks (EONs)

F. Shirin Abkenar, A. G. Rahbar, "Cost Effectiveness of Bandwidth Granularity in Optical Networks," in *Optical Switching and Networking*, vol. 22, pp. 117-128, 2016.

F. Shirin Abkenar, A. G. Rahbar, and M. Shamsi, "Performance Analysis of Elastic Optical Networks (EONs) Switches under Unicast traffic," in *Iran Journal of Computer Science*, vol. 2, pp. 125- 129, 2019.



Elastic Optical Networks (EONs)

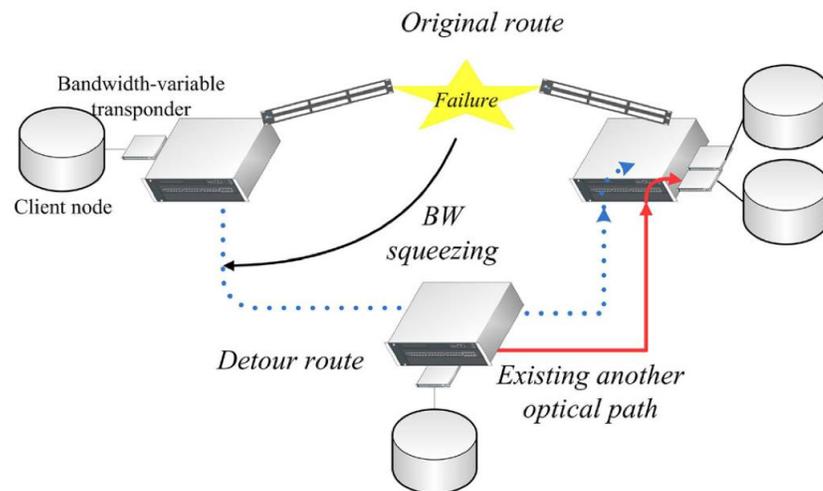
F. Shirin Abkenar, A. G. Rahbar, and A. Ebrahimzadeh, "Providing Quality of Service (QoS) for Data Traffic in Elastic Optical Networks (EoNs)," in *Arabian Journal for Science and Engineering*, vol. 41, pp. 797-806, 2016.

F. Shirin Abkenar, A. G. Rahbar, "The Energy Minimization Algorithm for Elastic Optical Networks," in *Photonic Network Communications*, vol. 42, pp. 15-26, 2021.

Elastic Optical Networks (EONs)

F. Shirin Abkenar, A. G. Rahbar, and A. Ebrahimzadeh, "Providing Quality of Service (QoS) for Data Traffic in Elastic Optical Networks (EoNs)," in *Arabian Journal for Science and Engineering*, vol. 41, pp. 797-806, 2016.

F. Shirin Abkenar, A. G. Rahbar, "The Energy Minimization Algorithm for Elastic Optical Networks," in *Photonic Network Communications*, vol. 42, pp. 15-26, 2021.

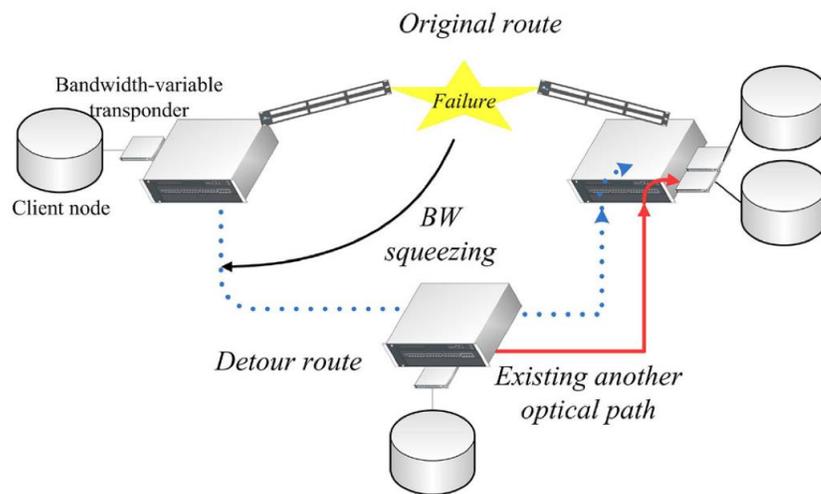


Squeezing

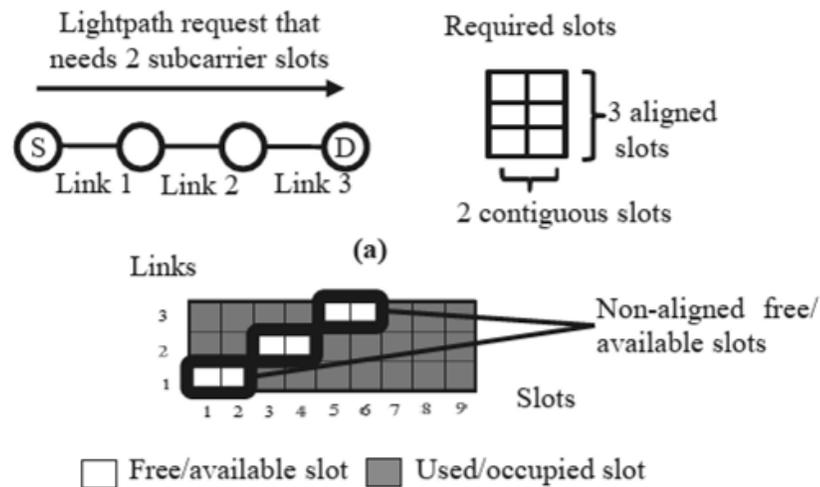
Elastic Optical Networks (EONs)

F. Shirin Abkenar, A. G. Rahbar, and A. Ebrahimzadeh, "Providing Quality of Service (QoS) for Data Traffic in Elastic Optical Networks (EoNs)," in *Arabian Journal for Science and Engineering*, vol. 41, pp. 797-806, 2016.

F. Shirin Abkenar, A. G. Rahbar, "The Energy Minimization Algorithm for Elastic Optical Networks," in *Photonic Network Communications*, vol. 42, pp. 15-26, 2021.



Squeezing

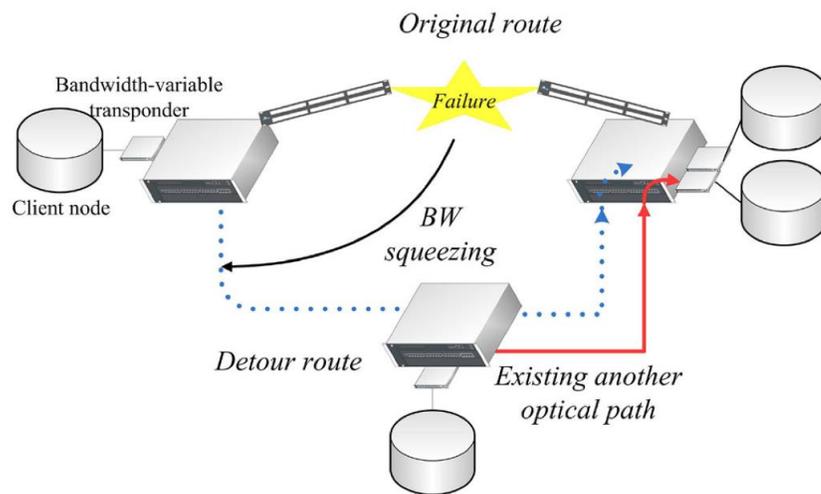


Fragmentation

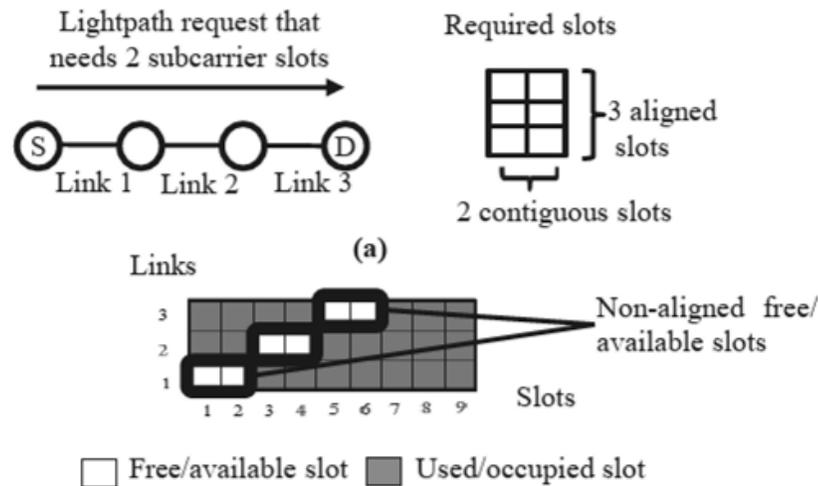
Elastic Optical Networks (EONs)

F. Shirin Abkenar, A. G. Rahbar, and A. Ebrahimzadeh, "Providing Quality of Service (QoS) for Data Traffic in Elastic Optical Networks (EoNs)," in *Arabian Journal for Science and Engineering*, vol. 41, pp. 797-806, 2016.

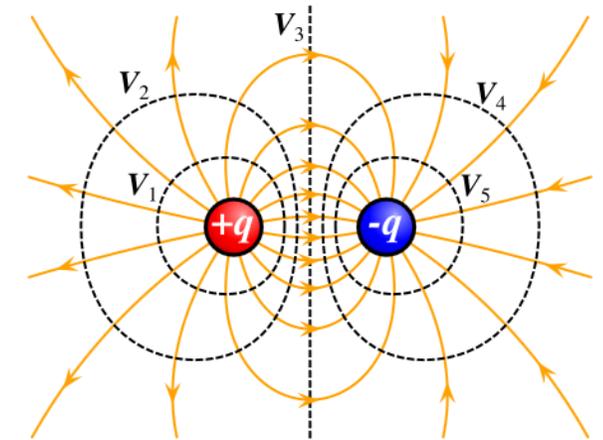
F. Shirin Abkenar, A. G. Rahbar, "The Energy Minimization Algorithm for Elastic Optical Networks," in *Photonic Network Communications*, vol. 42, pp. 15-26, 2021.



Squeezing



Fragmentation



Topology Potential

Elastic Optical Networks (EONs)



Elastic Optical Networks (EONs)

F. Shirin Abkenar, A. G. Rahbar, and A. Ebrahimzadeh, "Best fit (BF): A new Spectrum Allocation Mechanism in Elastic Optical Networks (EONs)," *2016 8th International Symposium on Telecommunications (IST)*, 2016, pp. 24-29.



Elastic Optical Networks (EONs)

F. Shirin Abkenar, A. G. Rahbar, and A. Ebrahimzadeh, "Best fit (BF): A new Spectrum Allocation Mechanism in Elastic Optical Networks (EONs)," *2016 8th International Symposium on Telecommunications (IST)*, 2016, pp. 24-29.



Elastic Optical Networks (EONs)

F. Shirin Abkenar, A. G. Rahbar, and A. Ebrahimzadeh, "Best fit (BF): A new Spectrum Allocation Mechanism in Elastic Optical Networks (EONs)," *2016 8th International Symposium on Telecommunications (IST)*, 2016, pp. 24-29.



F. Shirin Abkenar, A. G. Rahbar, "Study and Analysis of Routing and Spectrum Allocation (RSA) and Routing, Modulation Level and Spectrum Allocation (RMSA) Algorithms in Elastic Optical Networks (EONs)," in *Optical Switching and Networking*, vol. 23, pp. 5-39, 2017.





THE UNIVERSITY OF
SYDNEY

THE UNIVERSITY OF SYDNEY

Edge Computing



Cloud Layer

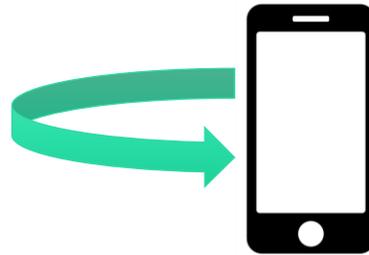


IoT Layer

Edge Computing

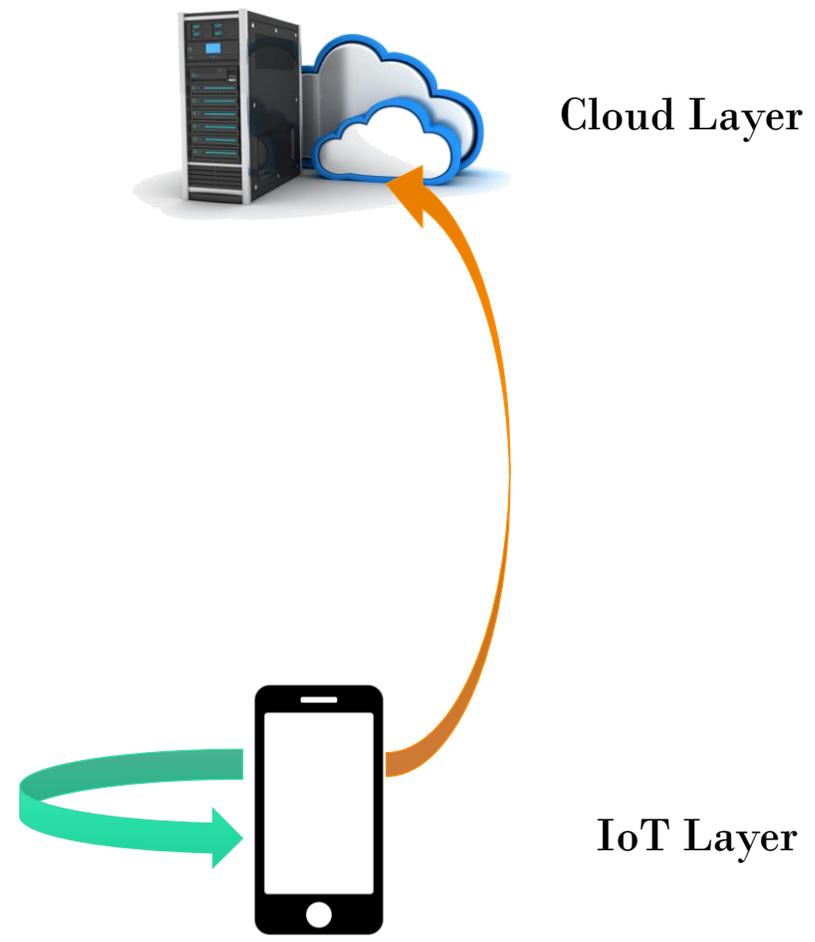


Cloud Layer



IoT Layer

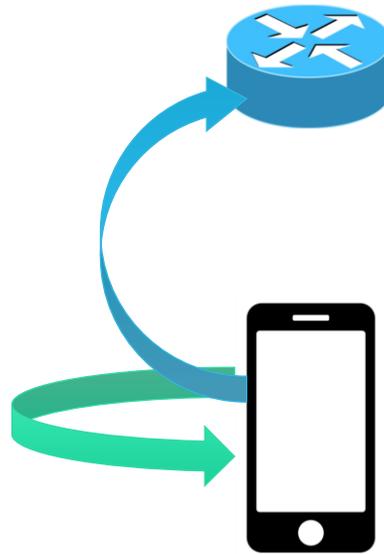
Edge Computing



Edge Computing



Cloud Layer



Edge Computing Layer

IoT Layer

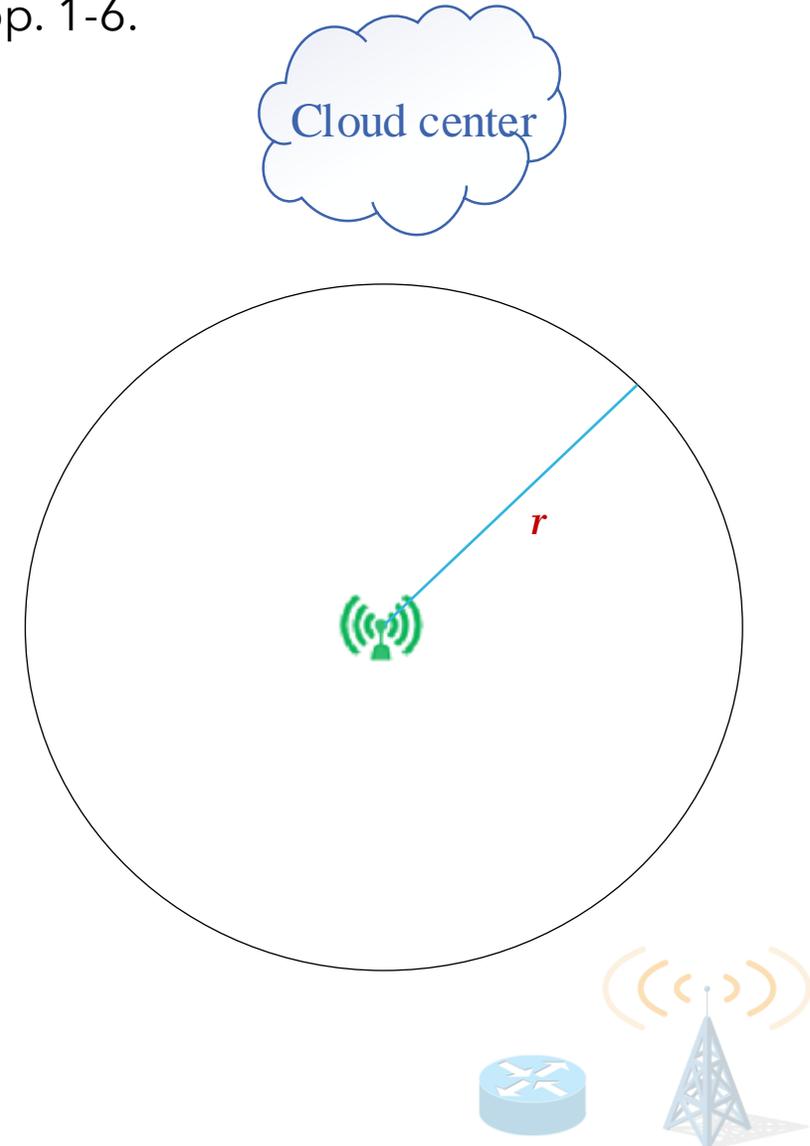
Edge Computing

F. Shirin Abkenar, Y. Zeng and A. Jamalipour, "Energy Consumption Tradeoff for Association-Free Fog-IoT," *ICC 2019 - 2019 IEEE International Conference on Communications (ICC)*, 2019, pp. 1-6.



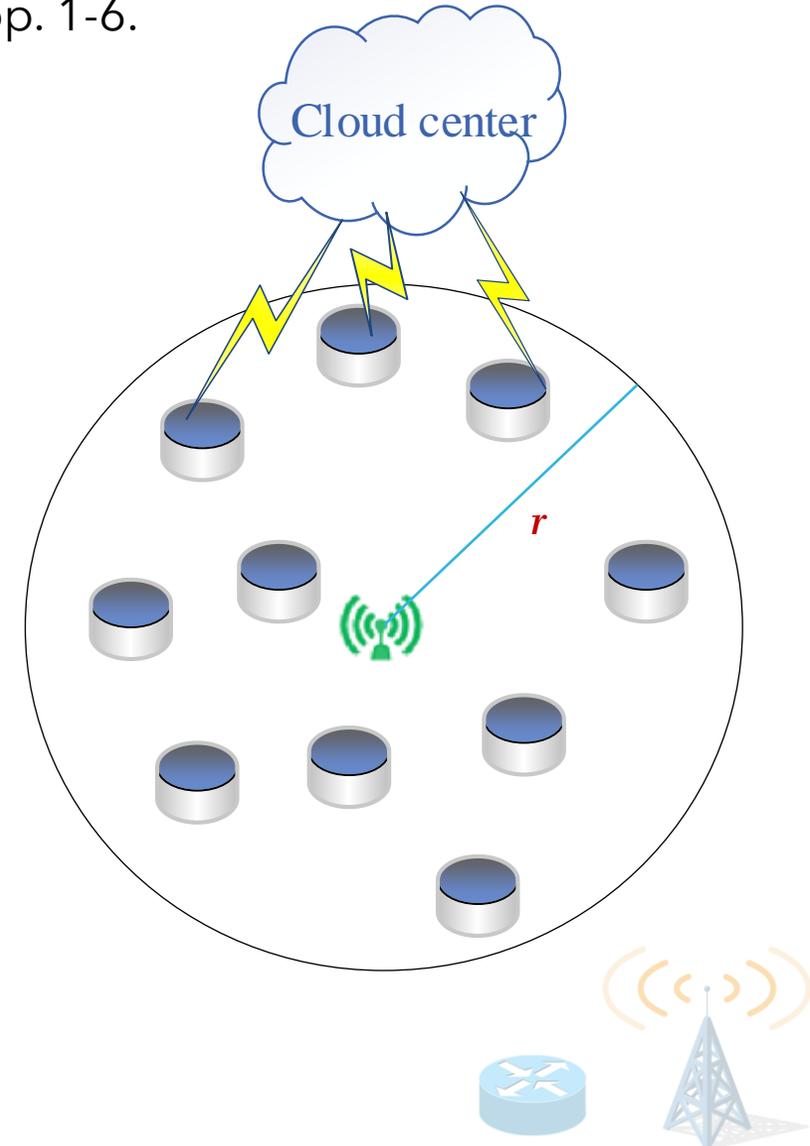
Edge Computing

F. Shirin Abkenar, Y. Zeng and A. Jamalipour, "Energy Consumption Tradeoff for Association-Free Fog-IoT," *ICC 2019 - 2019 IEEE International Conference on Communications (ICC)*, 2019, pp. 1-6.



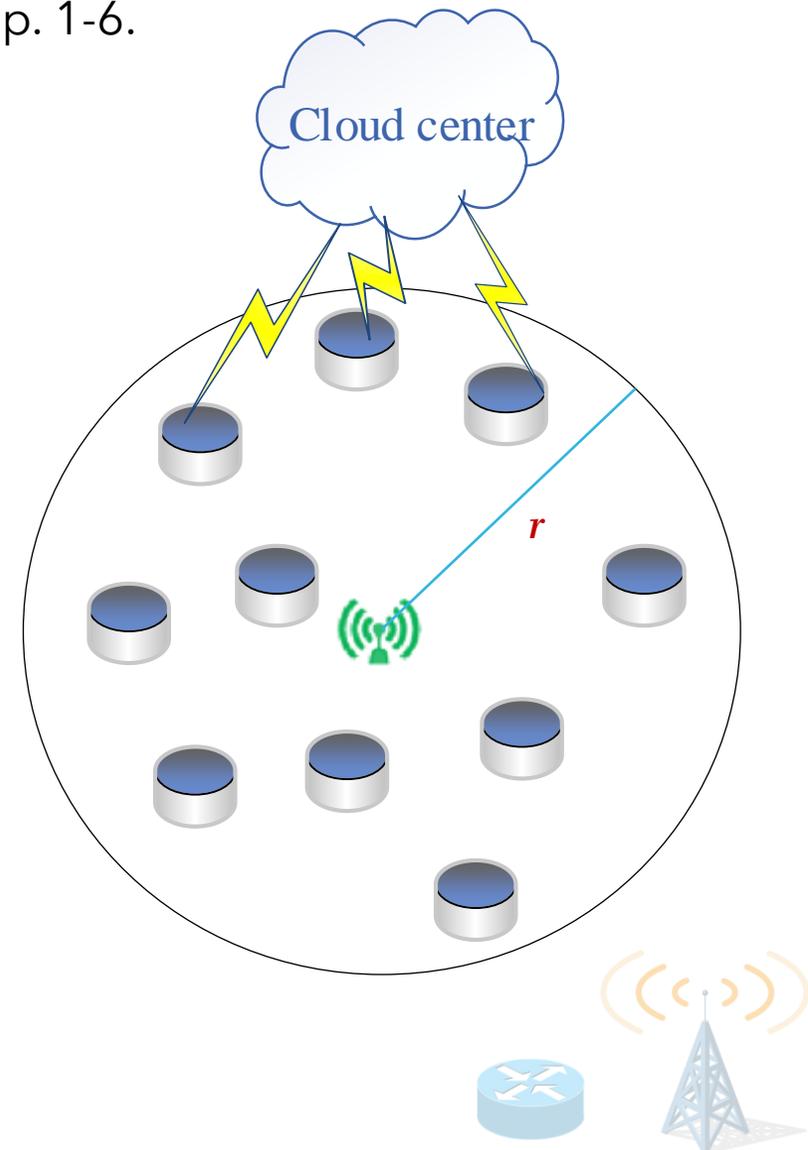
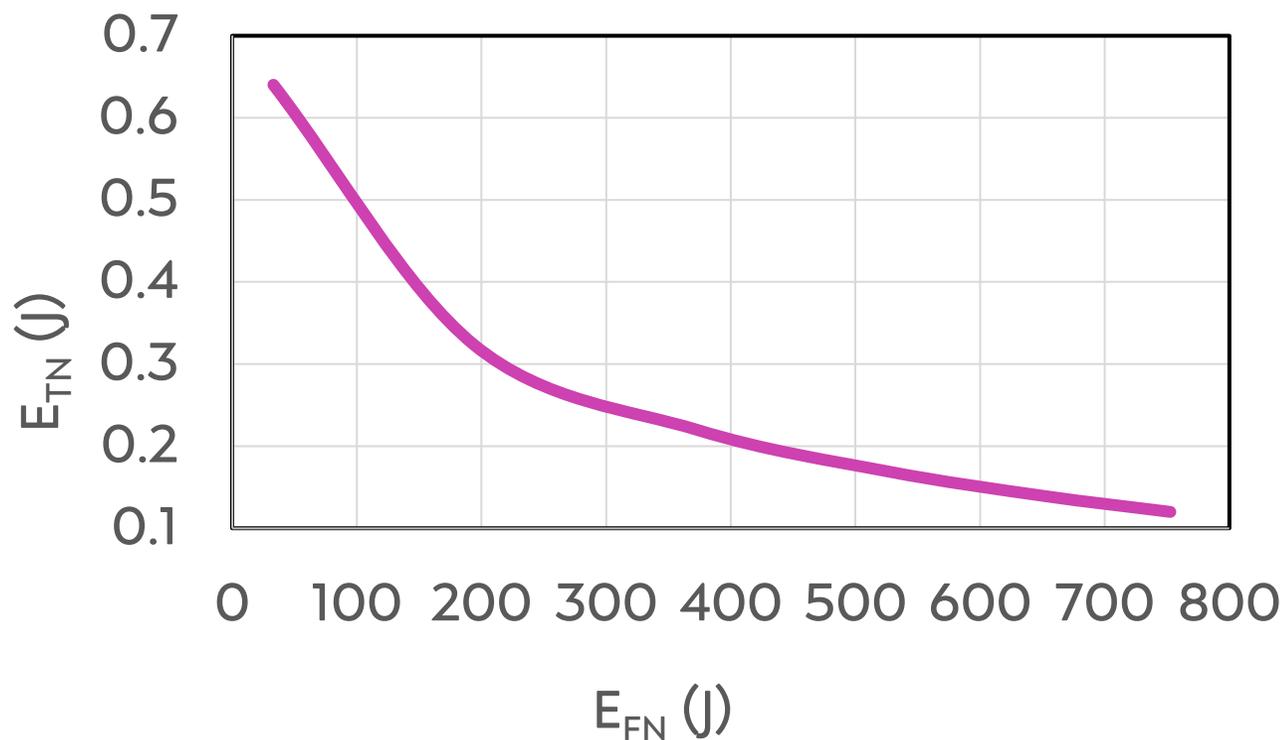
Edge Computing

F. Shirin Abkenar, Y. Zeng and A. Jamalipour, "Energy Consumption Tradeoff for Association-Free Fog-IoT," *ICC 2019 - 2019 IEEE International Conference on Communications (ICC)*, 2019, pp. 1-6.



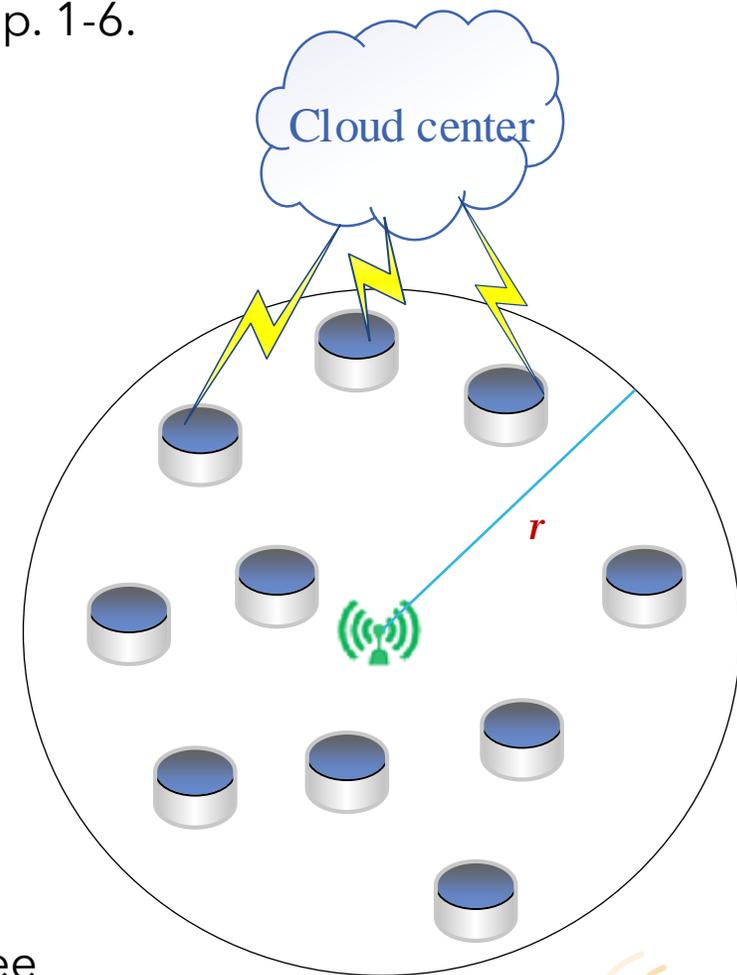
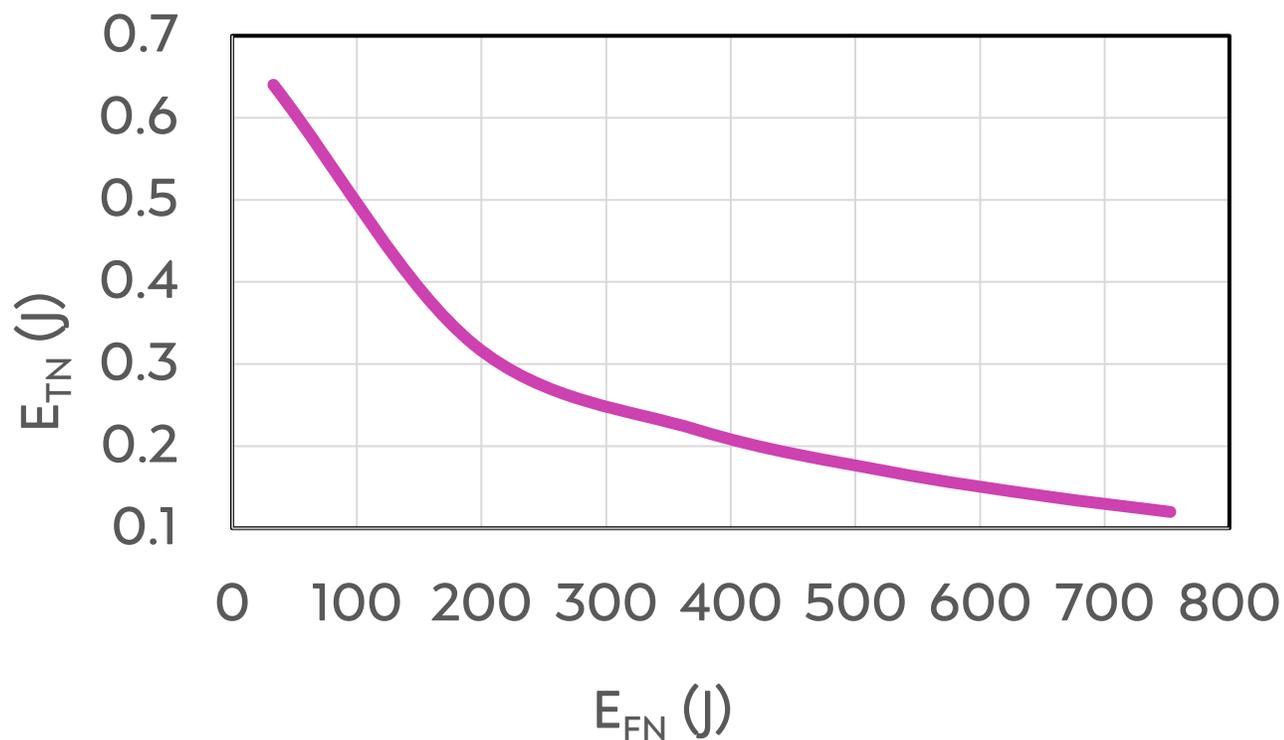
Edge Computing

F. Shirin Abkenar, Y. Zeng and A. Jamalipour, "Energy Consumption Tradeoff for Association-Free Fog-IoT," *ICC 2019 - 2019 IEEE International Conference on Communications (ICC)*, 2019, pp. 1-6.



Edge Computing

F. Shirin Abkenar, Y. Zeng and A. Jamalipour, "Energy Consumption Tradeoff for Association-Free Fog-IoT," *ICC 2019 - 2019 IEEE International Conference on Communications (ICC)*, 2019, pp. 1-6.



F. Shirin Abkenar and A. Jamalipour, "Energy Optimization in Association-Free Fog-IoT Networks," in *IEEE Transactions on Green Communications and Networking*, vol. 4, no. 2, pp. 404-412, June 2020.

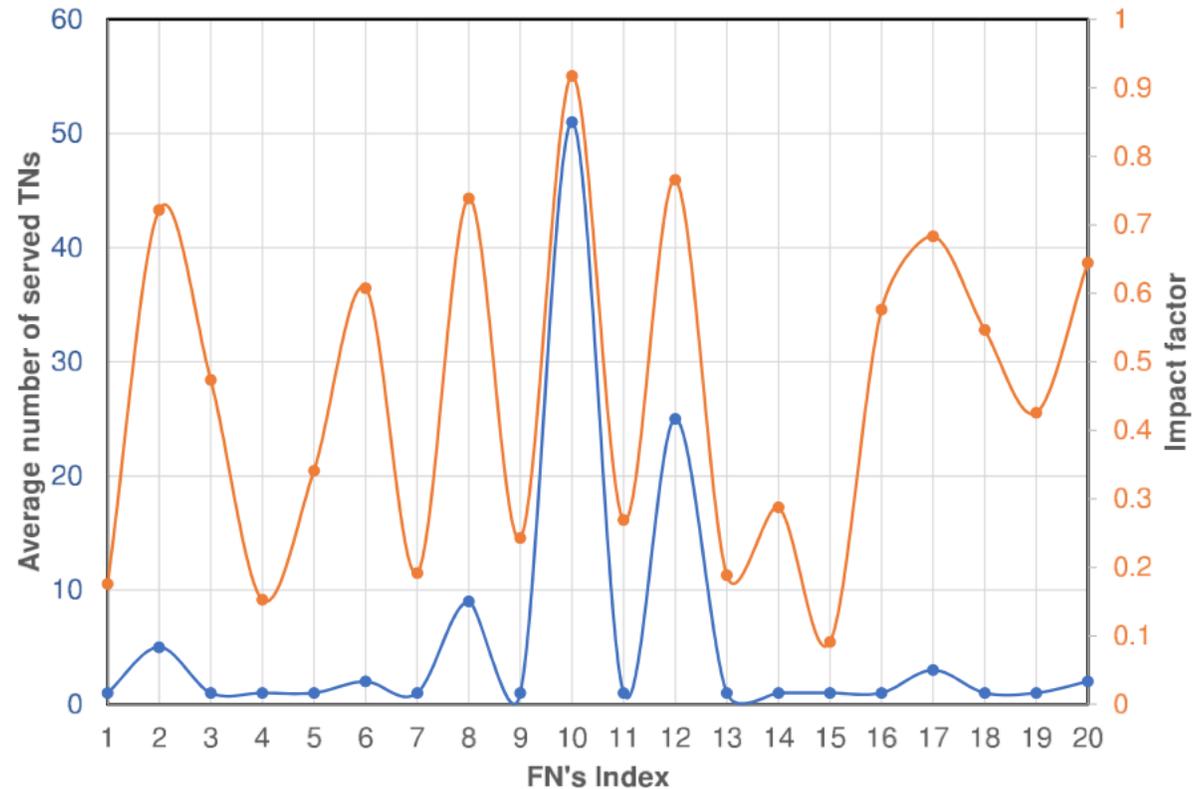
Edge Computing

F. Shirin Abkenar and A. Jamalipour, "EBA: Energy Balancing Algorithm for Fog-IoT Networks," in *IEEE Internet of Things Journal*, vol. 6, no. 4, pp. 6843-6849, 2019.



Edge Computing

F. Shirin Abkenar and A. Jamalipour, "EBA: Energy Balancing Algorithm for Fog-IoT Networks," in *IEEE Internet of Things Journal*, vol. 6, no. 4, pp. 6843-6849, 2019.



Edge Computing

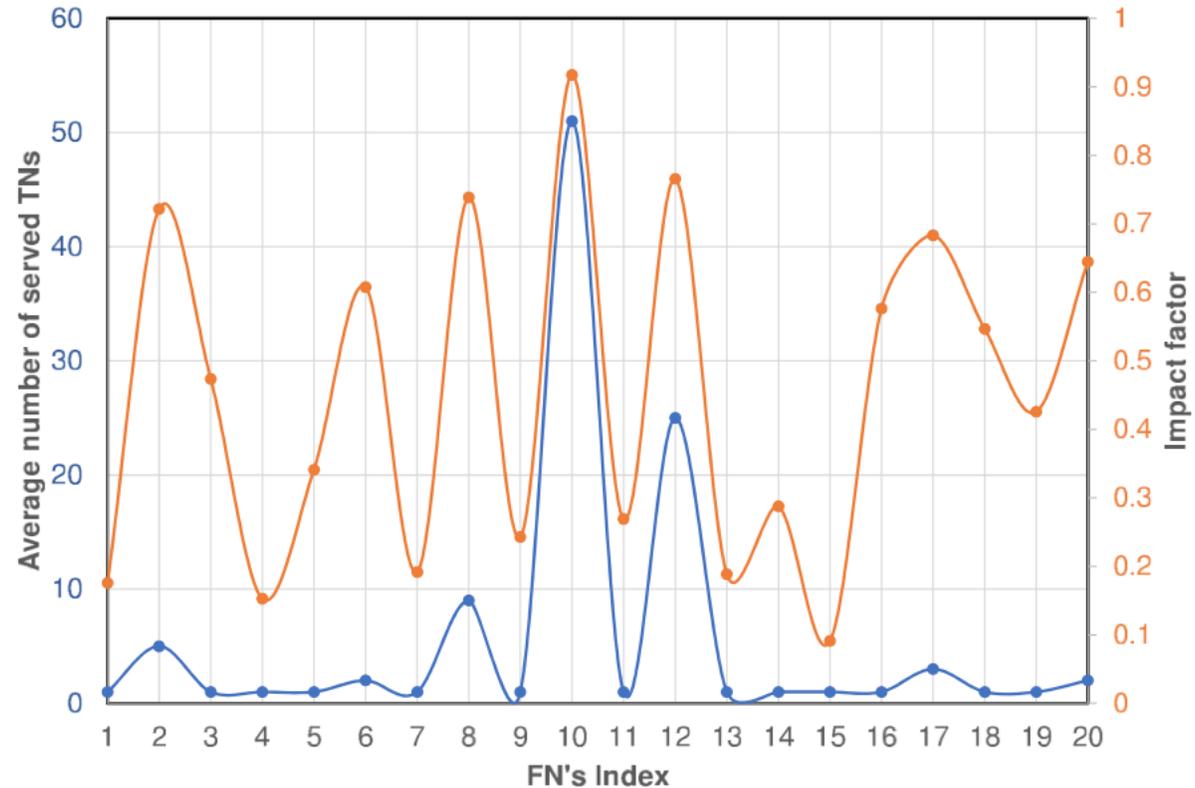
F. Shirin Abkenar and A. Jamalipour, "EBA: Energy Balancing Algorithm for Fog-IoT Networks," in *IEEE Internet of Things Journal*, vol. 6, no. 4, pp. 6843-6849, 2019.

$$\text{BTPR: } \underset{P_i, R_i}{\text{minimize}} \sum_{i=1}^M E_i + \sum_{j=1}^N E_j$$

s.t.

$$P_i \geq P_i^{\min} \quad \forall i \in \mathcal{U}$$

$$R_i \leq \min\left\{\frac{\eta_j}{B}, R_i^{\max}\right\} \quad \forall i \in \mathcal{U}, \forall j \in \mathcal{F}.$$



Edge Computing

F. Shirin Abkenar and A. Jamalipour, "EBA: Energy Balancing Algorithm for Fog-IoT Networks," in *IEEE Internet of Things Journal*, vol. 6, no. 4, pp. 6843-6849, 2019.

$$\text{BTPR: } \underset{P_i, R_i}{\text{minimize}} \sum_{i=1}^M E_i + \sum_{j=1}^N E_j$$

s.t.

$$P_i \geq P_i^{\min} \quad \forall i \in \mathcal{U}$$

$$R_i \leq \min\left\{\frac{\eta_j}{B}, R_i^{\max}\right\} \quad \forall i \in \mathcal{U}, \forall j \in \mathcal{F}.$$

$$\text{BFN: } \max_{\rho} f(\rho) = \max_{\rho} \sum_{j=1}^N \log(\rho_j)$$

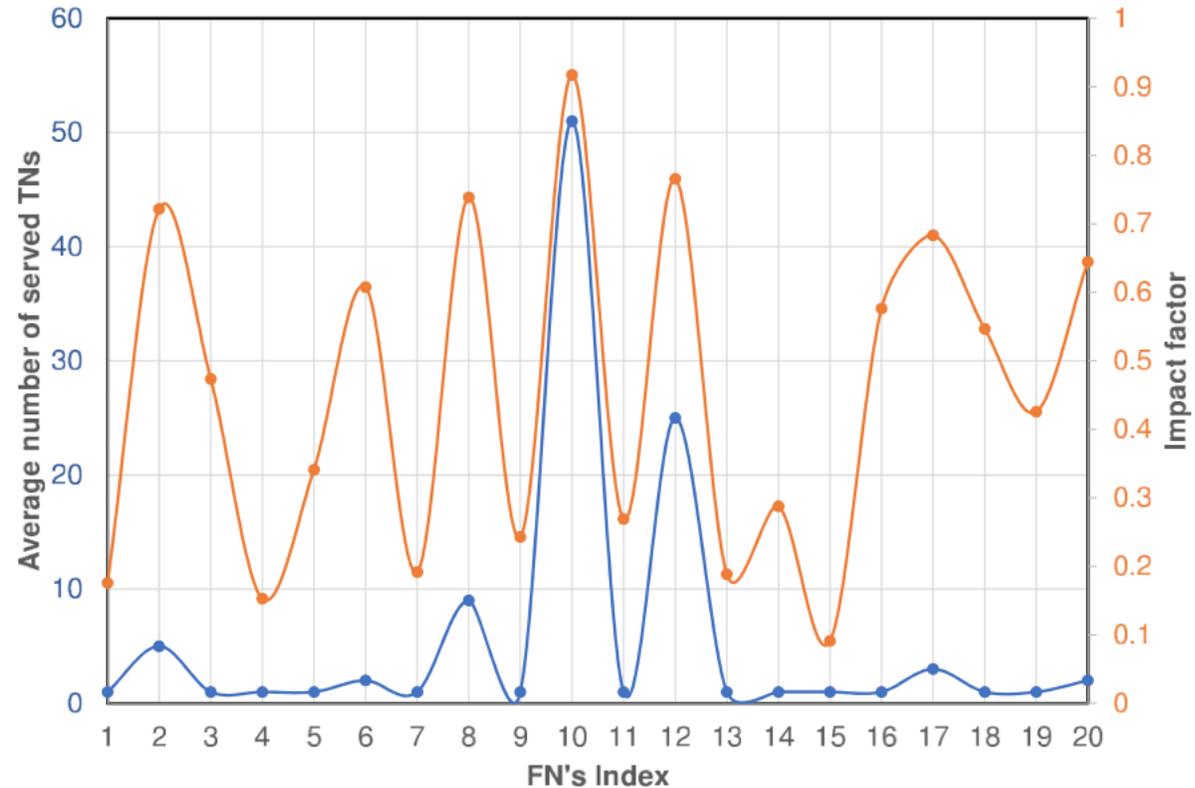
s.t.

$$\sum_{j=1}^N x_{ij} = 1 \quad \forall i \in \mathcal{U}$$

$$\sum_{i=1}^M x_{ij} \leq m \quad \forall j \in \mathcal{F}$$

$$\hat{E}_j > E_j \quad \forall j \in \mathcal{F}$$

$$x_{ij} \in \{0, 1\} \quad \forall i \in \mathcal{U}, \forall j \in \mathcal{F}.$$



Edge Computing

F. Shirin Abkenar and A. Jamalipour, "EBA: Energy Balancing Algorithm for Fog-IoT Networks," in *IEEE Internet of Things Journal*, vol. 6, no. 4, pp. 6843-6849, 2019.

$$\text{BTPR: } \underset{P_i, R_i}{\text{minimize}} \sum_{i=1}^M E_i + \sum_{j=1}^N E_j$$

s.t.

$$P_i \geq P_i^{\min} \quad \forall i \in \mathcal{U}$$

$$R_i \leq \min\left\{\frac{\eta_j}{B}, R_i^{\max}\right\} \quad \forall i \in \mathcal{U}, \forall j \in \mathcal{F}.$$

$$\text{BFN: } \max_{\rho} f(\rho) = \max_{\rho} \sum_{j=1}^N \log(\rho_j)$$

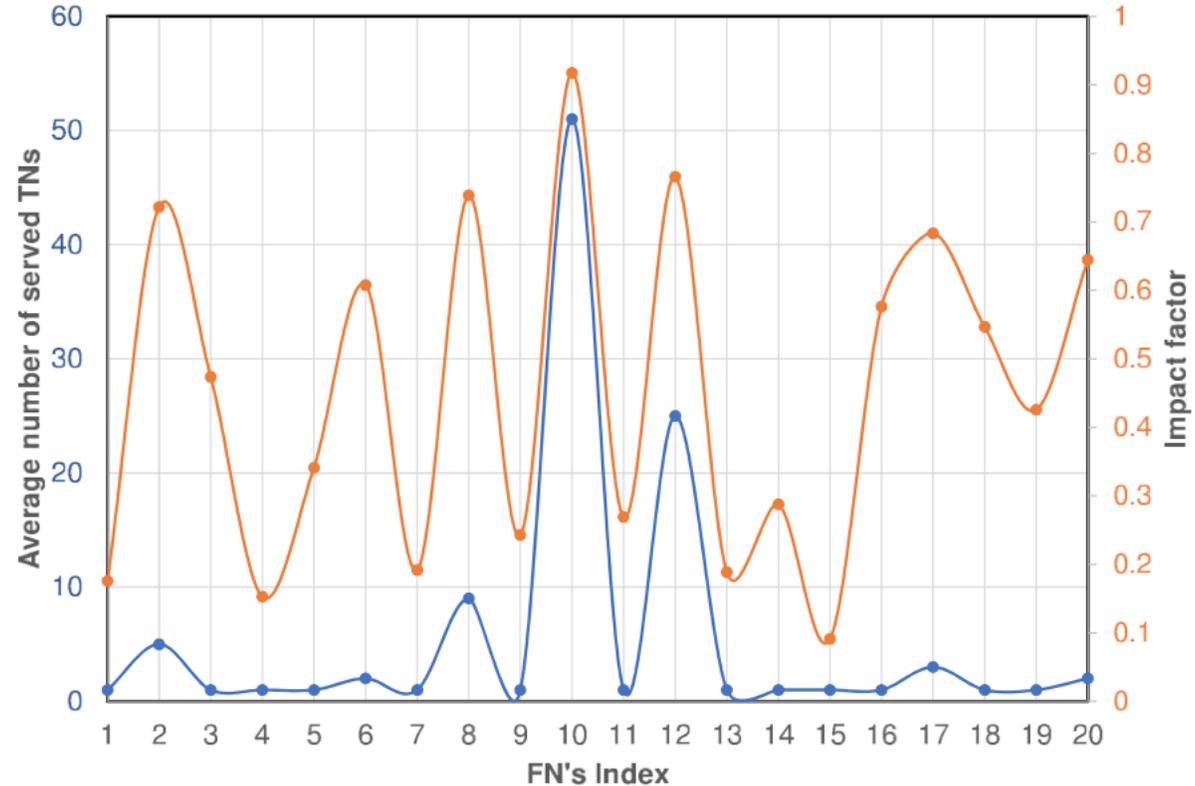
s.t.

$$\sum_{j=1}^N x_{ij} = 1 \quad \forall i \in \mathcal{U}$$

$$\sum_{i=1}^M x_{ij} \leq m \quad \forall j \in \mathcal{F}$$

$$\hat{E}_j > E_j \quad \forall j \in \mathcal{F}$$

$$x_{ij} \in \{0, 1\} \quad \forall i \in \mathcal{U}, \forall j \in \mathcal{F}.$$



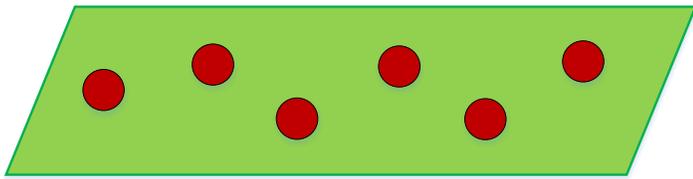
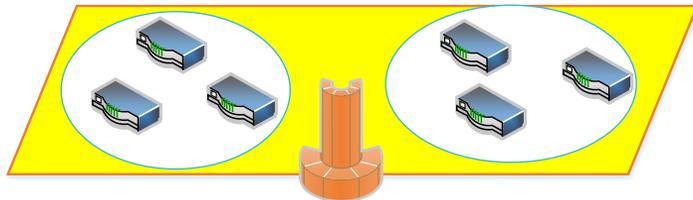
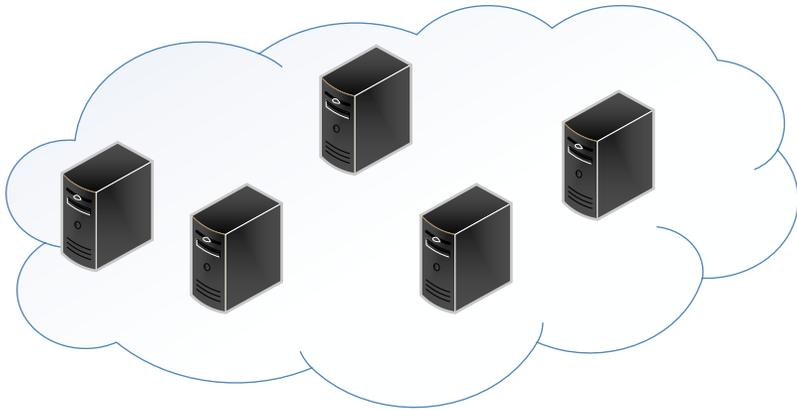
F. Shirin Abkenar and A. Jamalipour, "A Reliable Data Loss Aware Algorithm for Fog-IoT Networks," in *IEEE Transactions on Vehicular Technology*, vol. 69, no. 5, pp. 5718-5722, 2020.



Edge Computing

F. Shirin Abkenar, K. S. Khan and A. Jamalipour, "Smart-Cluster-Based Distributed Caching for Fog-IoT Networks," in *IEEE Internet of Things Journal*, vol. 8, no. 5, pp. 3875-3884, 2021.

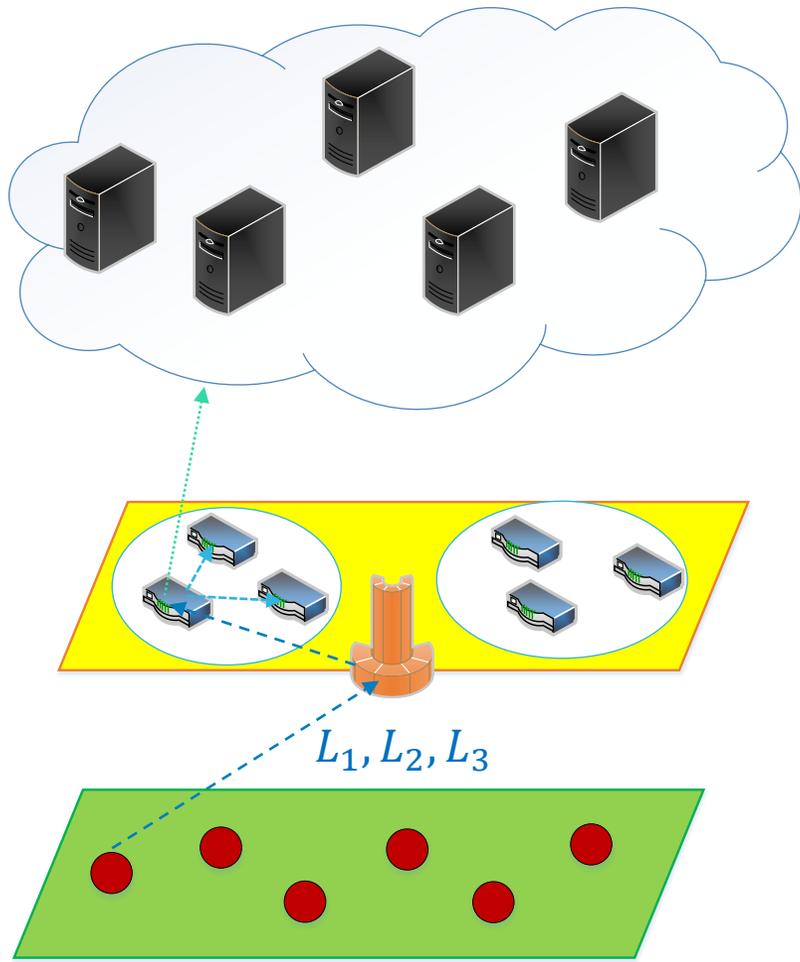
Regular Caching



Edge Computing

F. Shirin Abkenar, K. S. Khan and A. Jamalipour, "Smart-Cluster-Based Distributed Caching for Fog-IoT Networks," in *IEEE Internet of Things Journal*, vol. 8, no. 5, pp. 3875-3884, 2021.

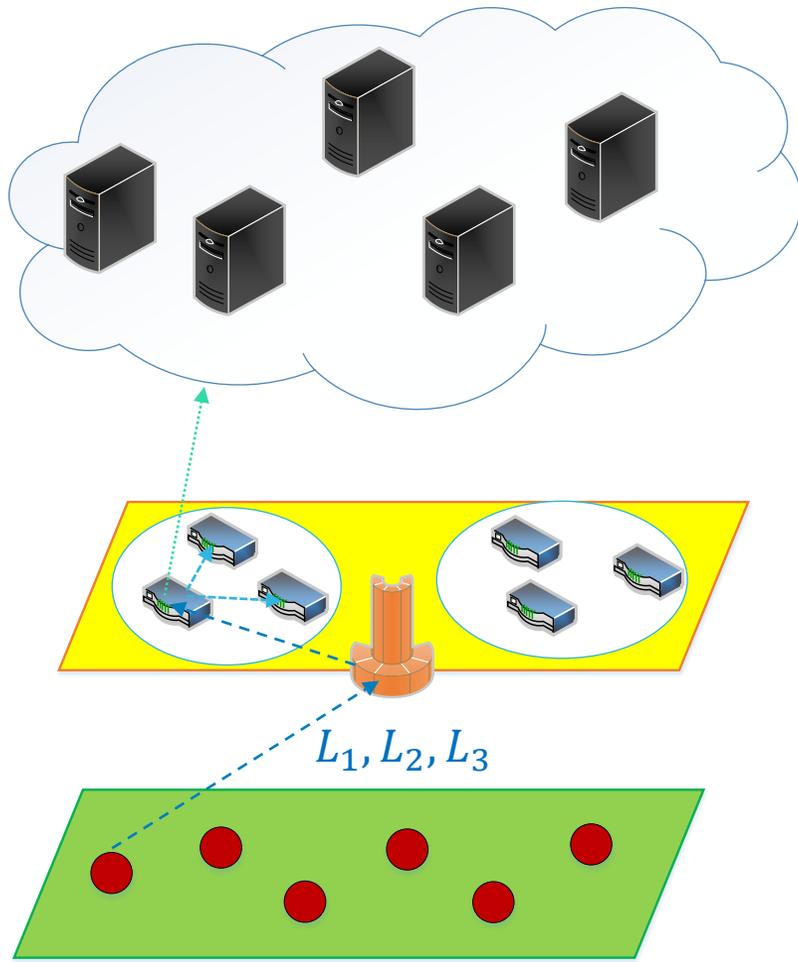
Regular Caching



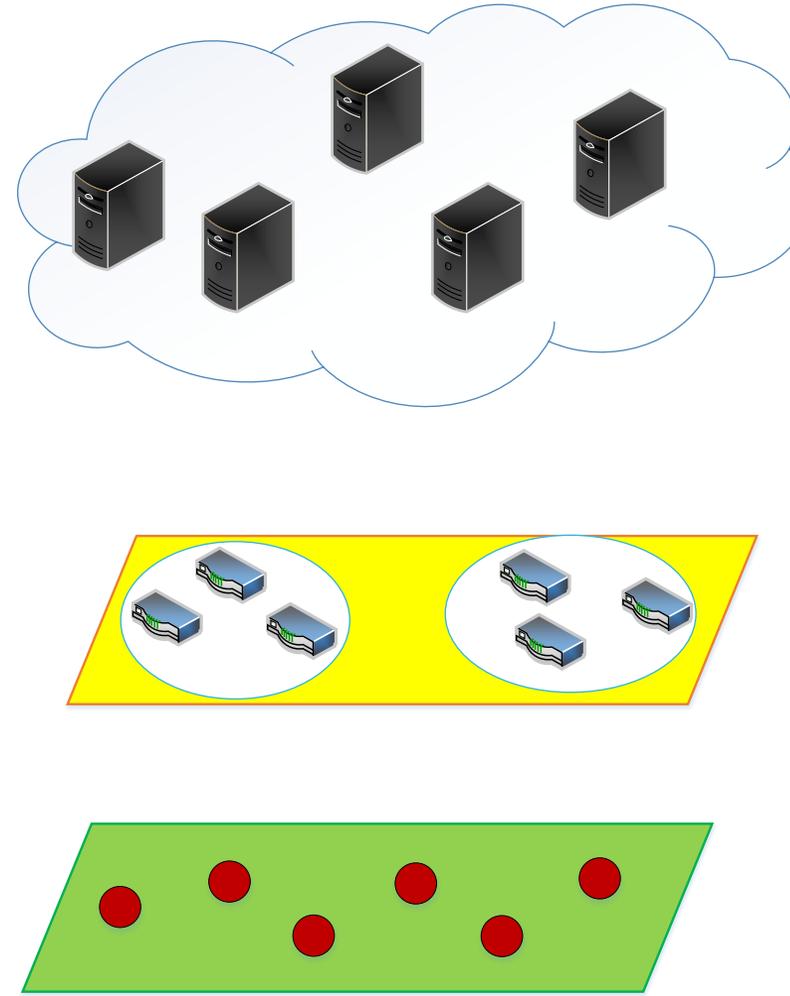
Edge Computing

F. Shirin Abkenar, K. S. Khan and A. Jamalipour, "Smart-Cluster-Based Distributed Caching for Fog-IoT Networks," in *IEEE Internet of Things Journal*, vol. 8, no. 5, pp. 3875-3884, 2021.

Regular Caching



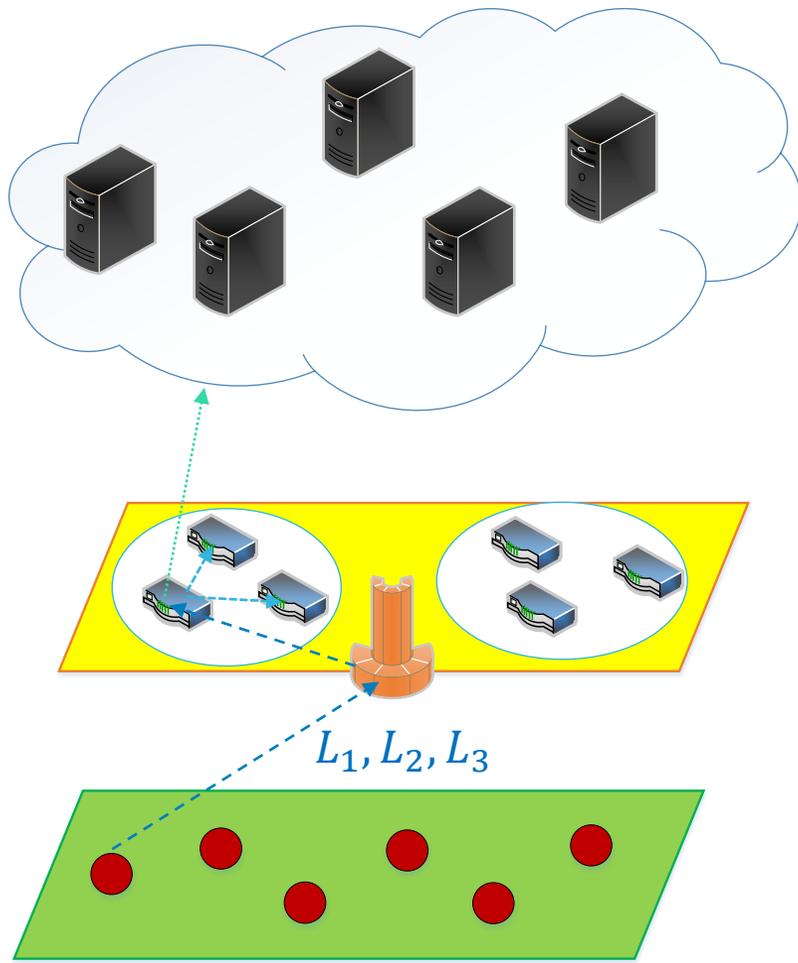
Smart Caching



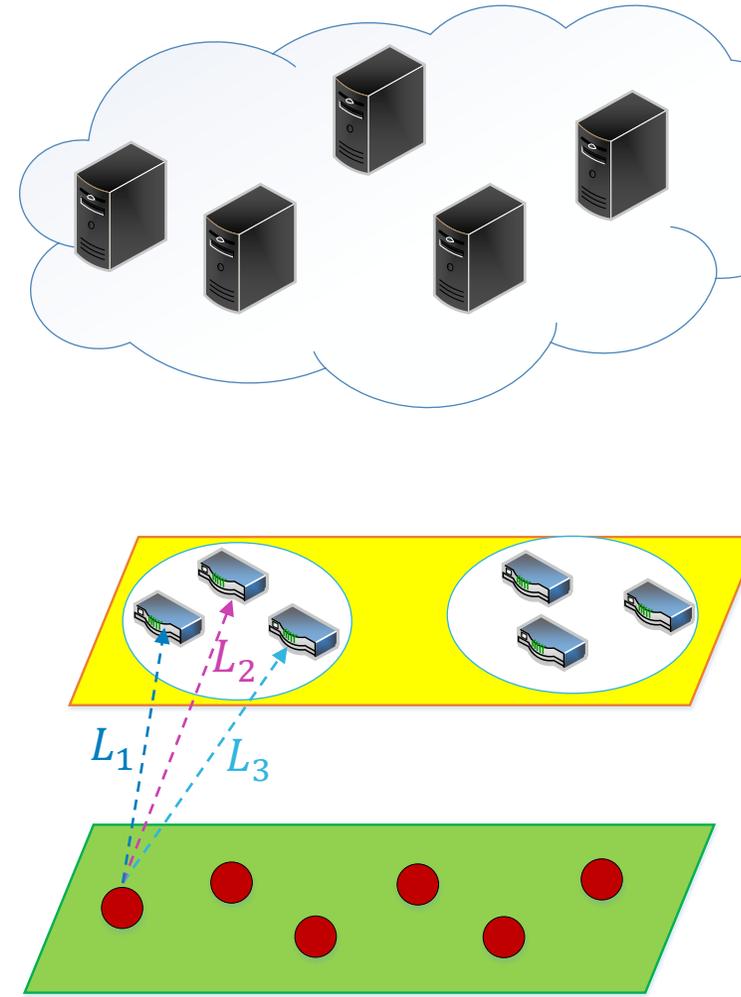
Edge Computing

F. Shirin Abkenar, K. S. Khan and A. Jamalipour, "Smart-Cluster-Based Distributed Caching for Fog-IoT Networks," in *IEEE Internet of Things Journal*, vol. 8, no. 5, pp. 3875-3884, 2021.

Regular Caching



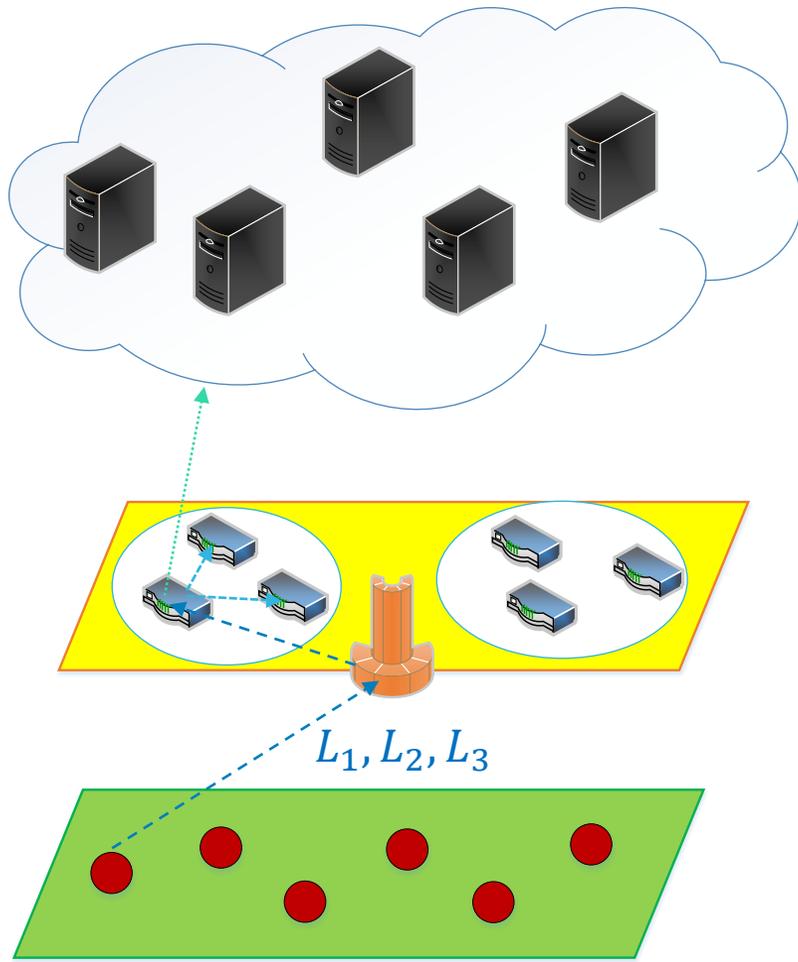
Smart Caching



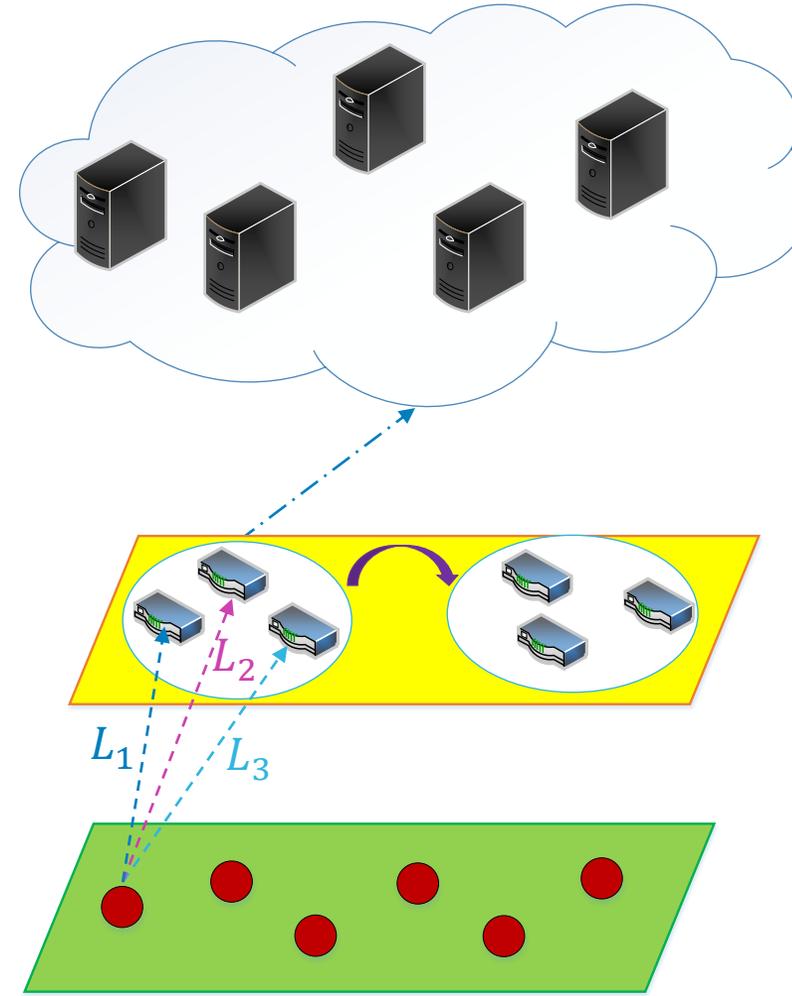
Edge Computing

F. Shirin Abkenar, K. S. Khan and A. Jamalipour, "Smart-Cluster-Based Distributed Caching for Fog-IoT Networks," in *IEEE Internet of Things Journal*, vol. 8, no. 5, pp. 3875-3884, 2021.

Regular Caching

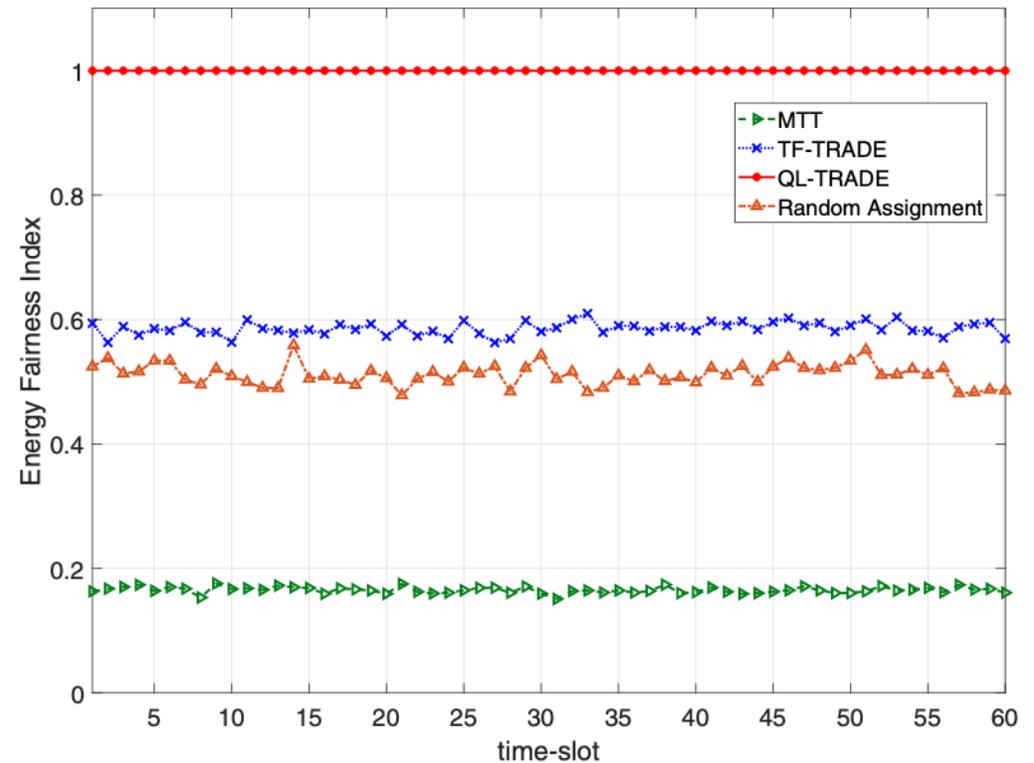
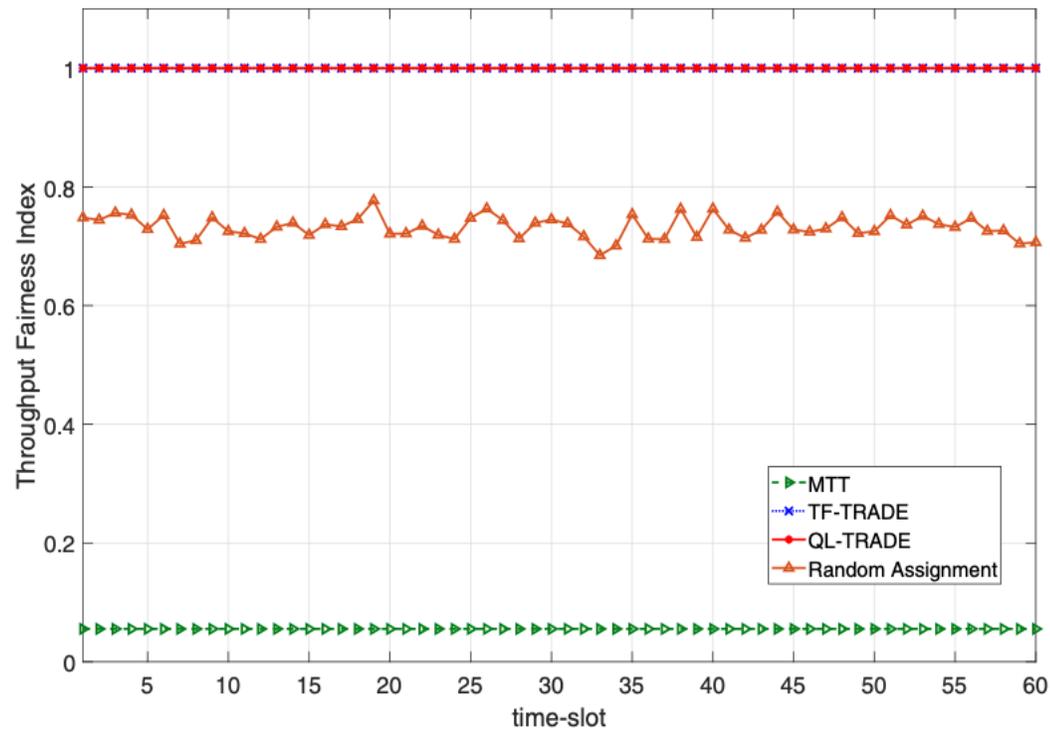


Smart Caching



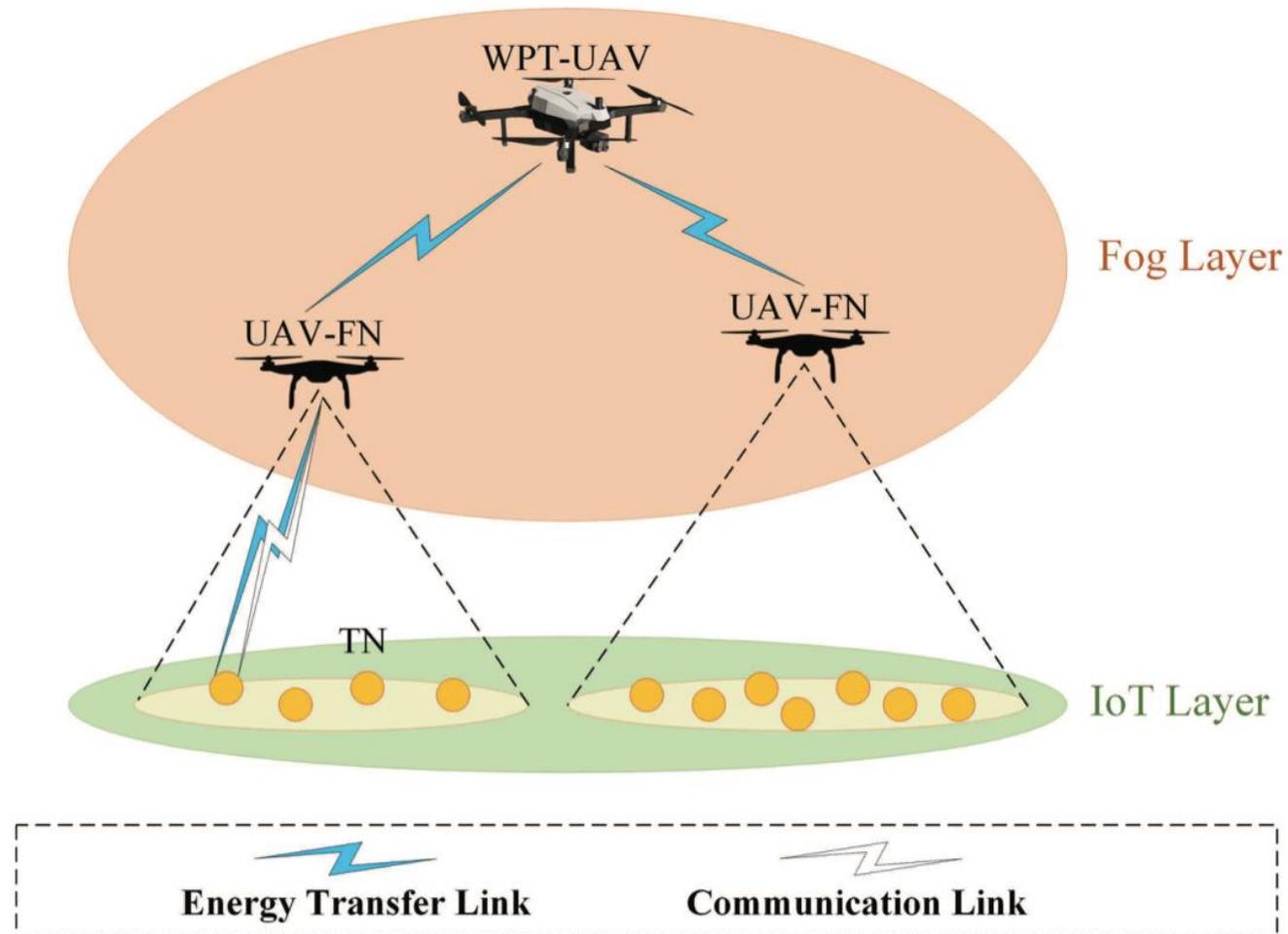
Edge Computing

F. Shirin Abkenar, M. Z. Alam and A. Jamalipour, "Transaction Throughput Maximization under Delay and Energy Constraints in Fog-IoT Networks," *GLOBECOM 2020 - 2020 IEEE Global Communications Conference*, 2020, pp. 1-6.



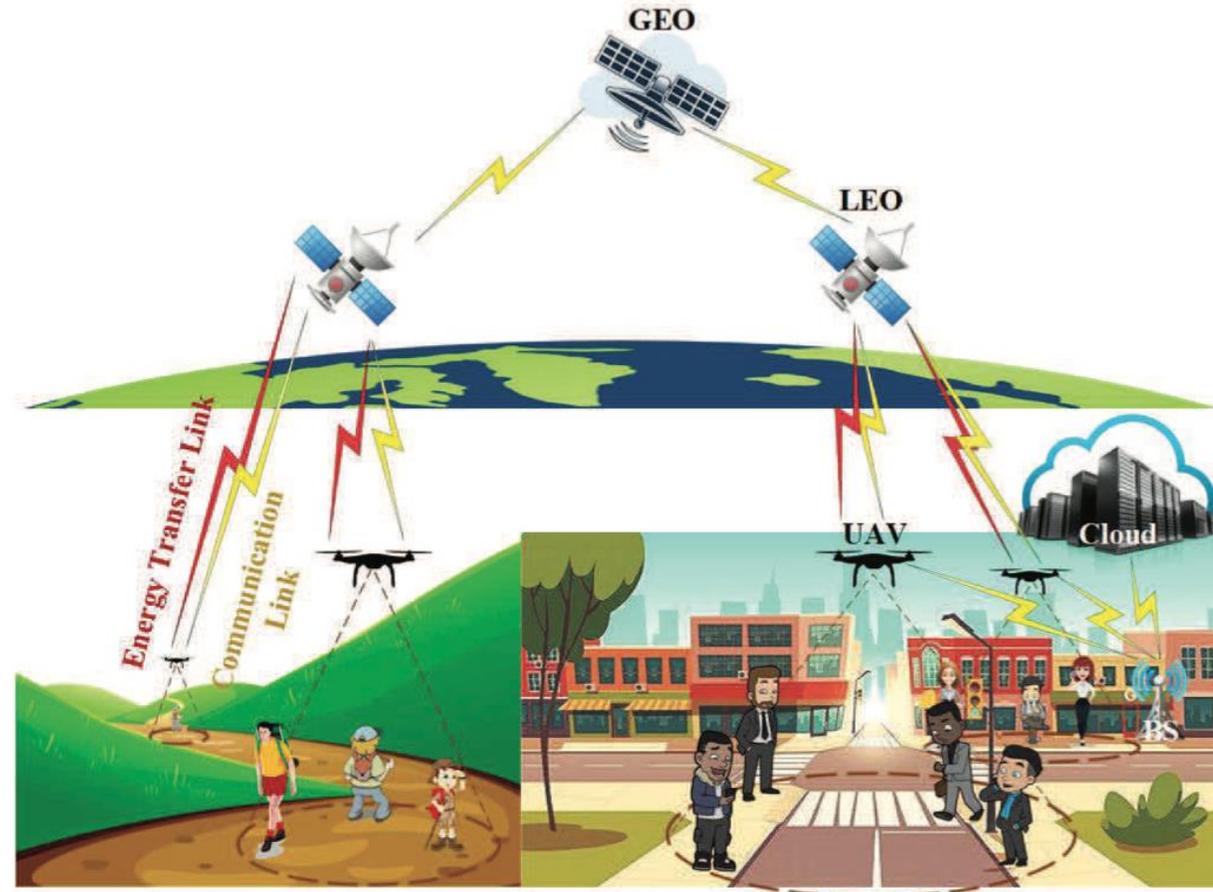
Edge Computing

F. **Shirin Abkenar**, S. Iranmanesh, A. Bouguettaya, R. Raad and A. Jamalipour, "ENERGENT: An energy-efficient UAV-assisted fog-IoT framework for disaster management," in *Journal of Communications and Networks*, vol. 24, no. 6, pp. 698-709, 2022.



Edge Computing

A. Jamalipour and **F. Shirin Abkenar**, "Efficient Task Allocation Protocol for a Hybrid-Hierarchical Spatial-Aerial-Terrestrial Edge-Centric IoT Architecture," in *IEICE Transactions on Communications*, vol. E105.B, issue. 2, pp. 116-130, 2022.



Edge Computing

F. Shirin Abkenar, P. Ramezani, S. Iranmanesh, S. Murali, M. Chulerttiyawong, X. Wan, R. Raad, and A. Jamalipour, "A Survey on Mobility of Edge Computing Networks in IoT: State-of-the-Art, Architectures, and Challenges," in *IEEE Communications Surveys & Tutorials*, vol. 24, no. 4, pp. 2329-2365, Fourthquarter 2022.

S. Iranmanesh, **F. Shirin Abkenar**, A. Jamalipour and R. Raad, "A Heuristic Distributed Scheme to Detect Falsification of Mobility Patterns in Internet of Vehicles," in *IEEE Internet of Things Journal*, vol. 9, no. 1, pp. 719-727, 2022.

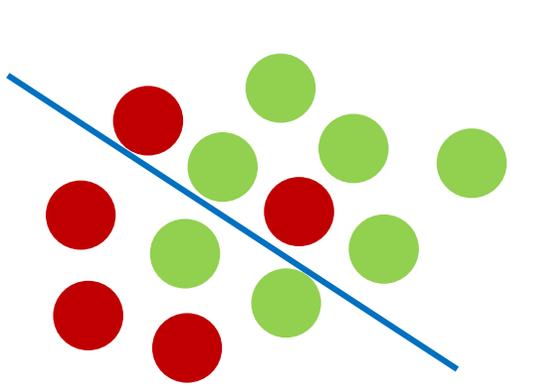
S. Iranmanesh, **F. Shirin Abkenar**, R. Raad and A. Jamalipour, "Improving Throughput of 5G Cellular Networks via 3D Placement Optimization of Logistics Drones," in *IEEE Transactions on Vehicular Technology*, vol. 70, no. 2, pp. 1448-1460, 2021.

M. Z. Alam, **F. Shirin Abkenar**, I. Adhicandra, S. Murali and A. Jamalipour, "Low-Delay Path Selection for Cluster-Based Buffer-Aided Vehicular Communications," in *IEEE Transactions on Vehicular Technology*, vol. 69, no. 9, pp. 9356-9363, 2020.

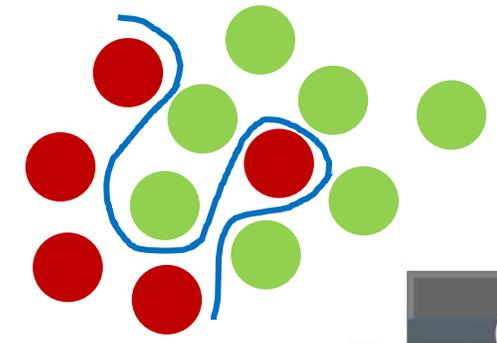




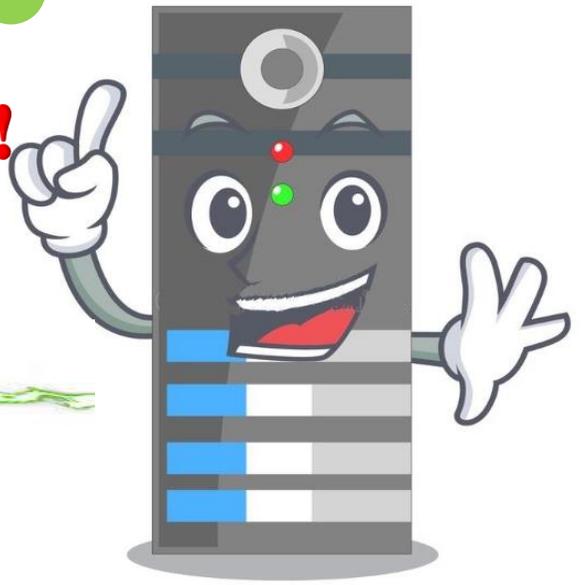
UNIVERSITY OF CALIFORNIA IRVINE

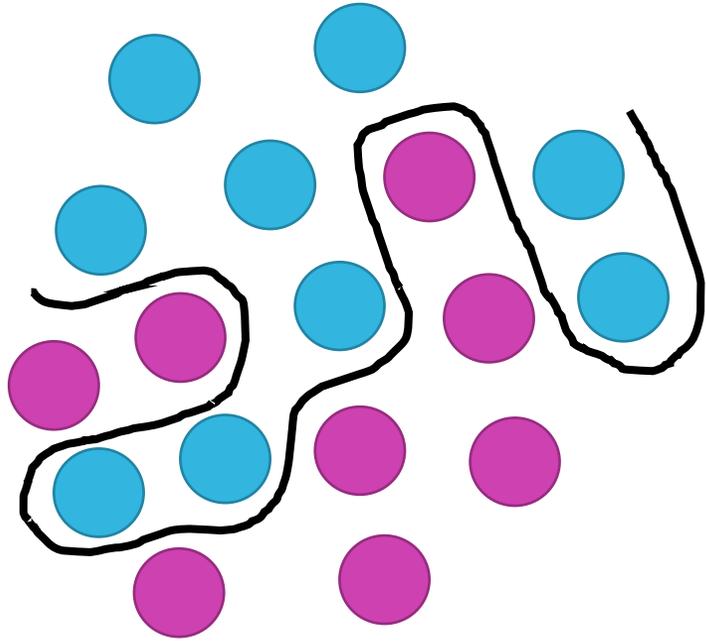


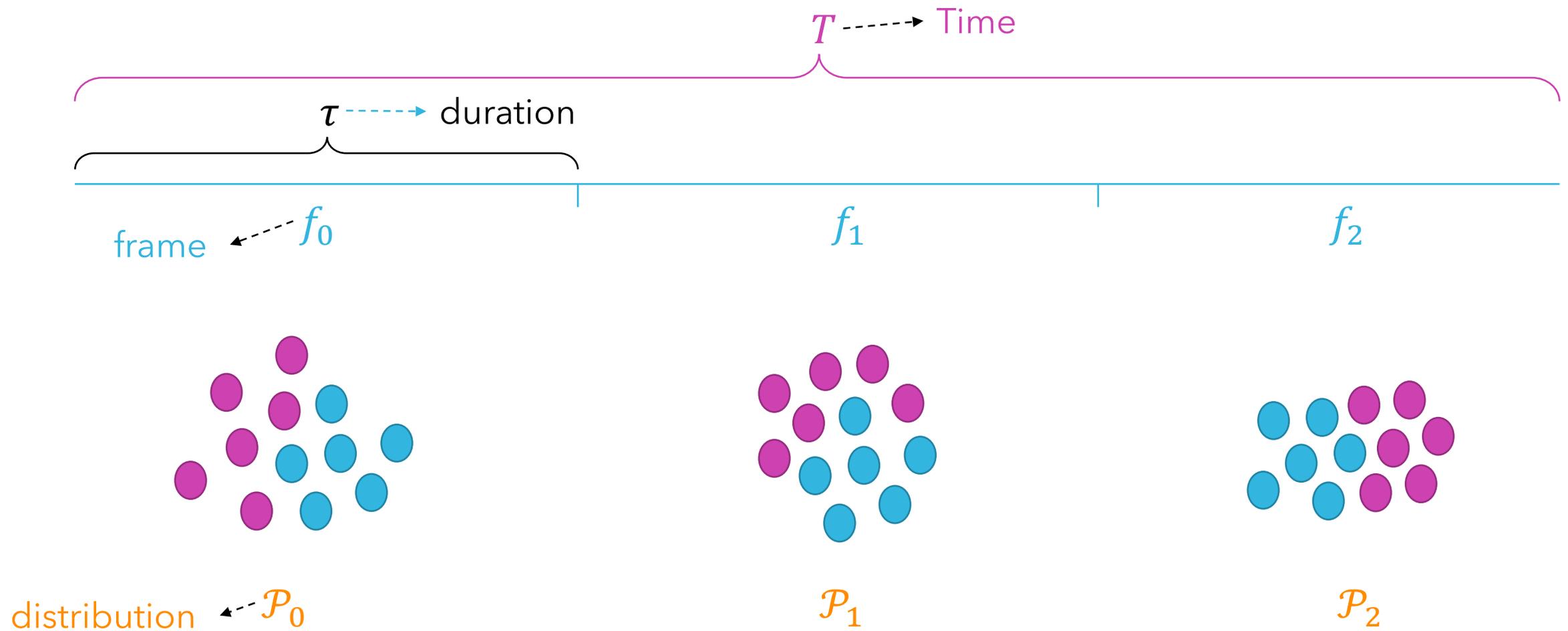
66.66....7%!!!

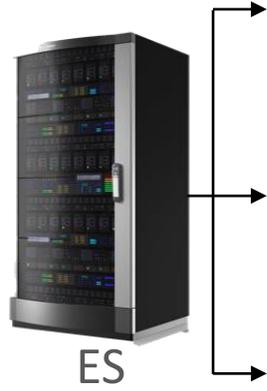
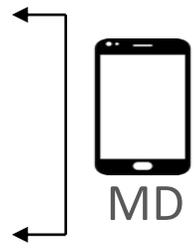


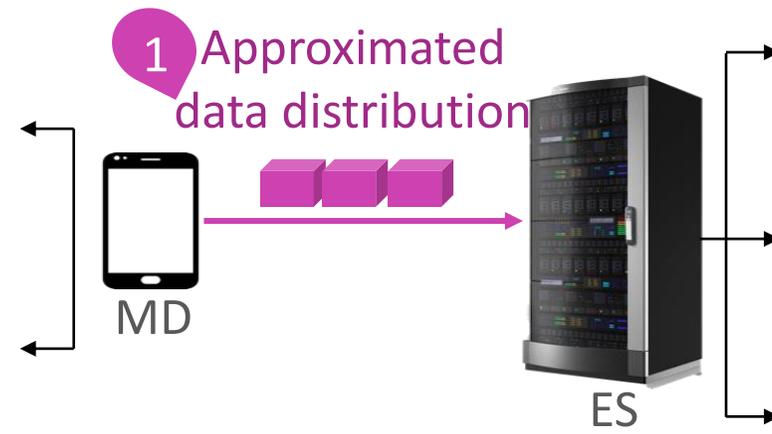
100%!!!

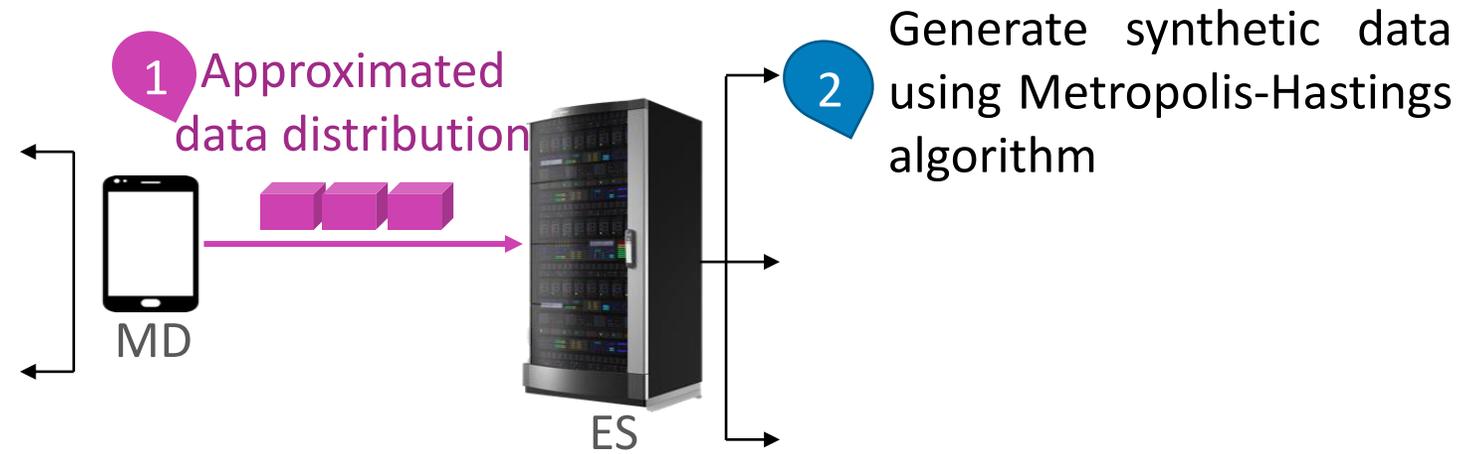


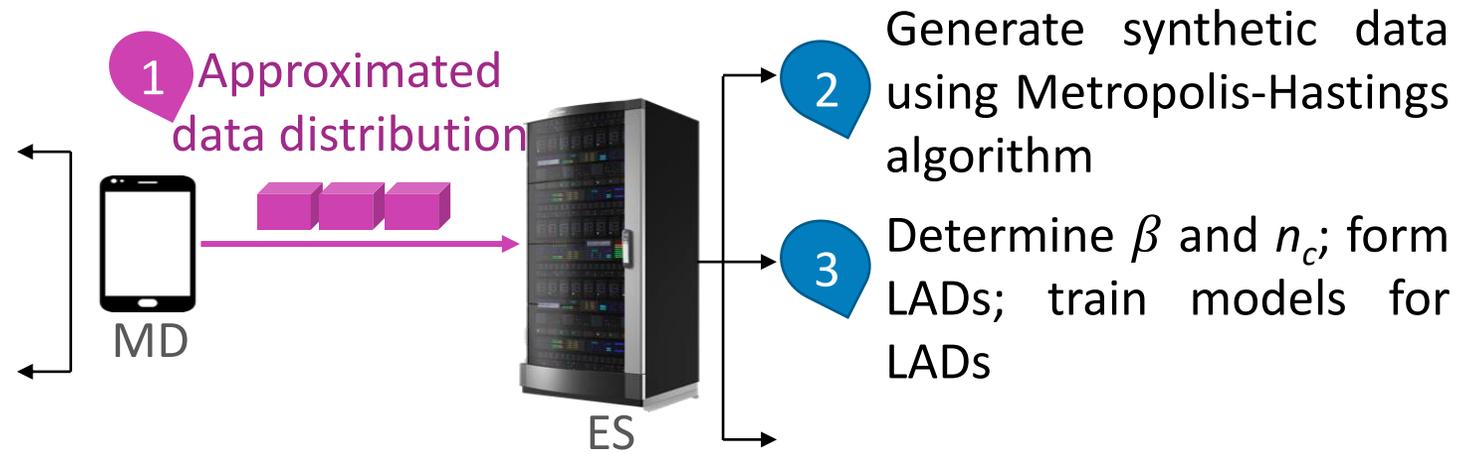


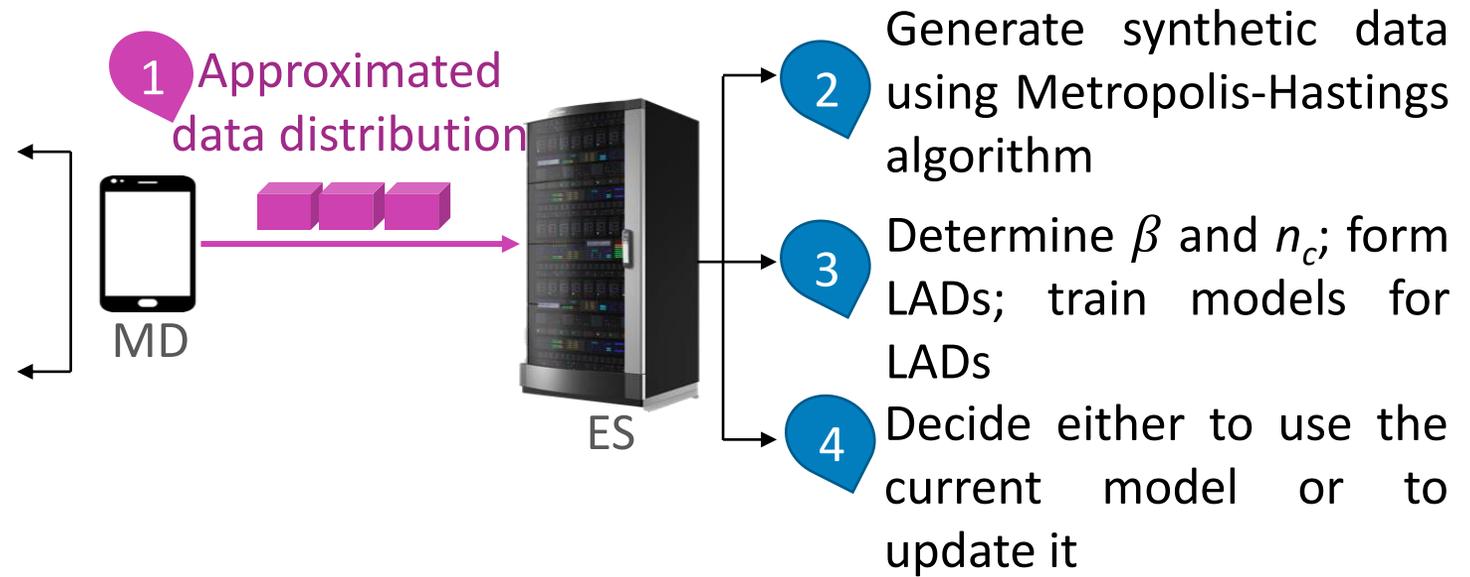


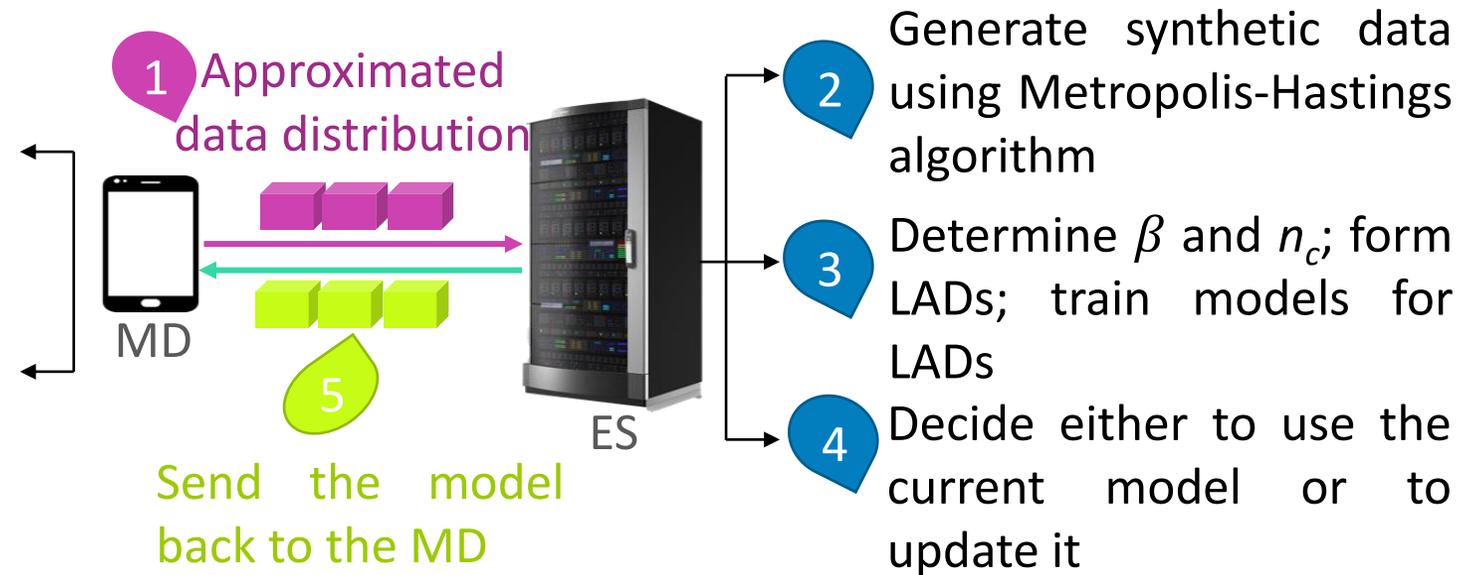






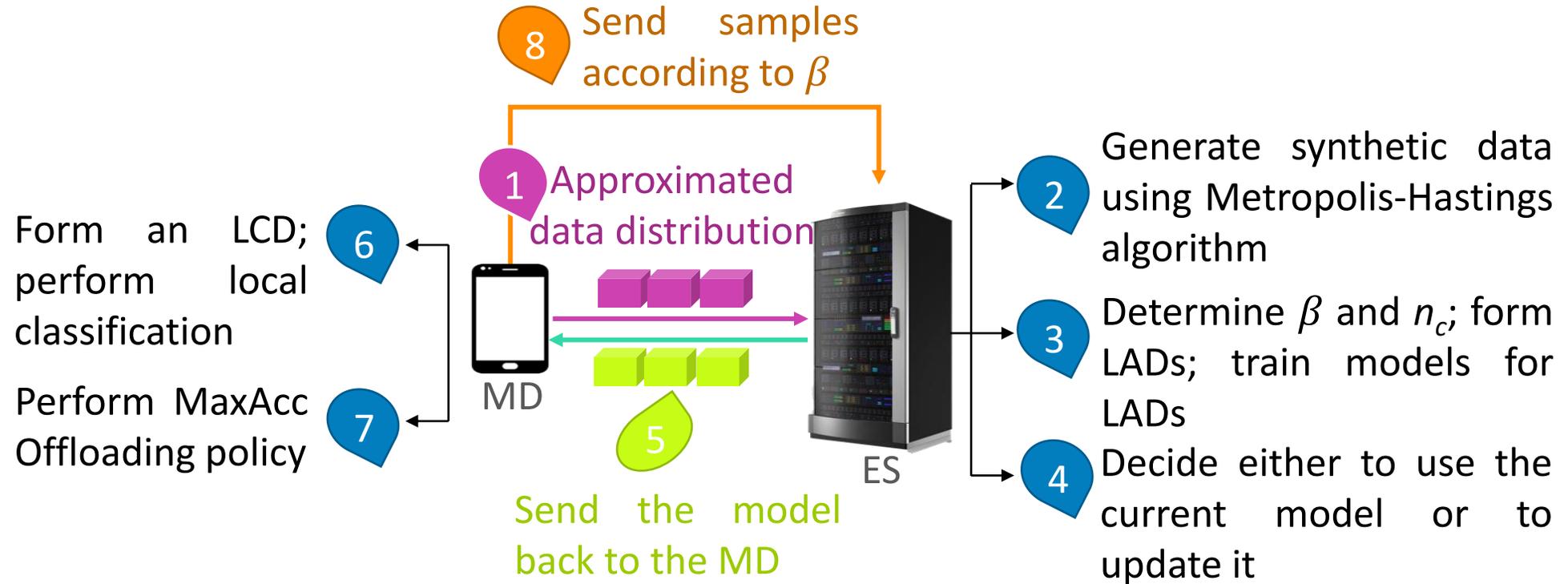






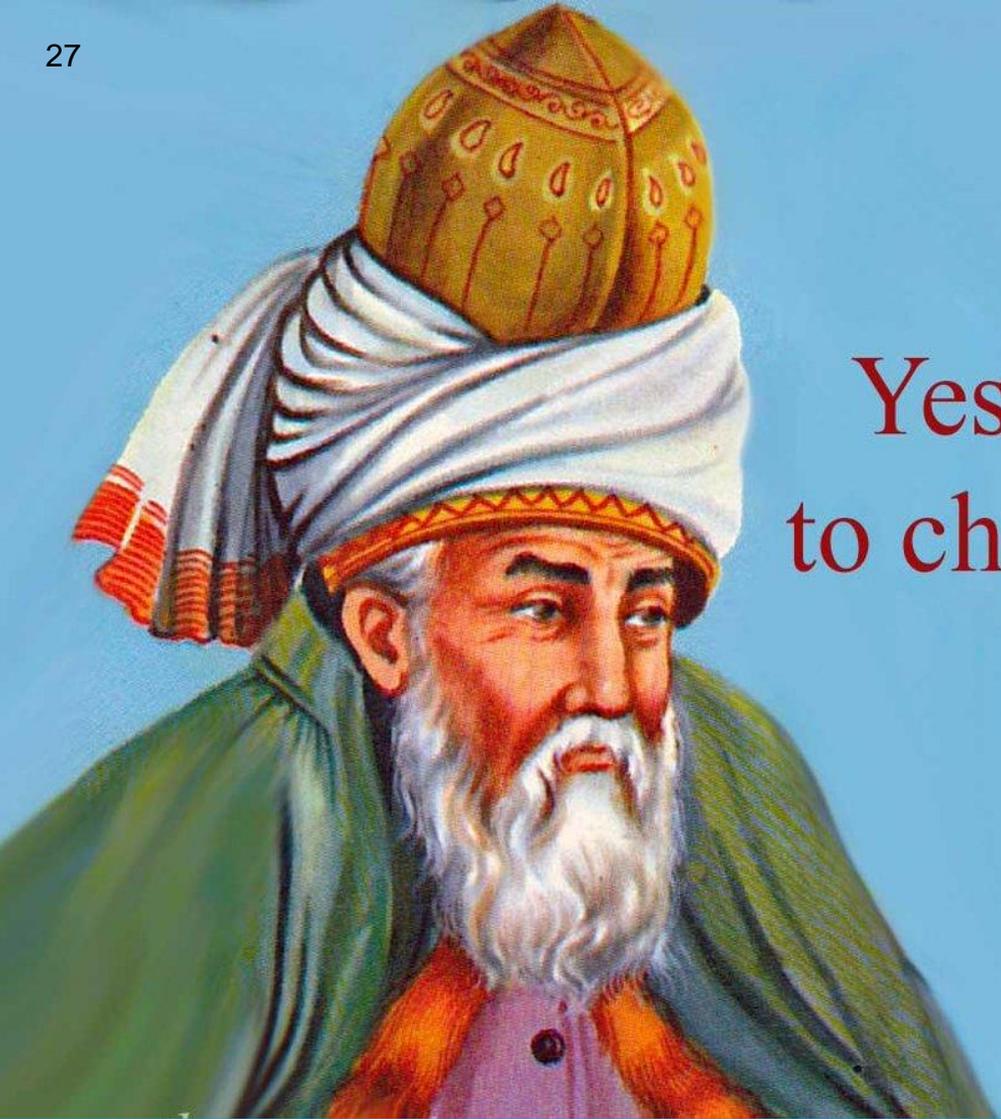








UNIVERSITY OF CALIFORNIA DAVIS



Yesterday I was clever, so I wanted
to change the world. Today I am wise,
so I am changing myself.

Rumi

THANKS A LOT