

# Smart and connected community network creates new autonomous vehicle services with big-data science

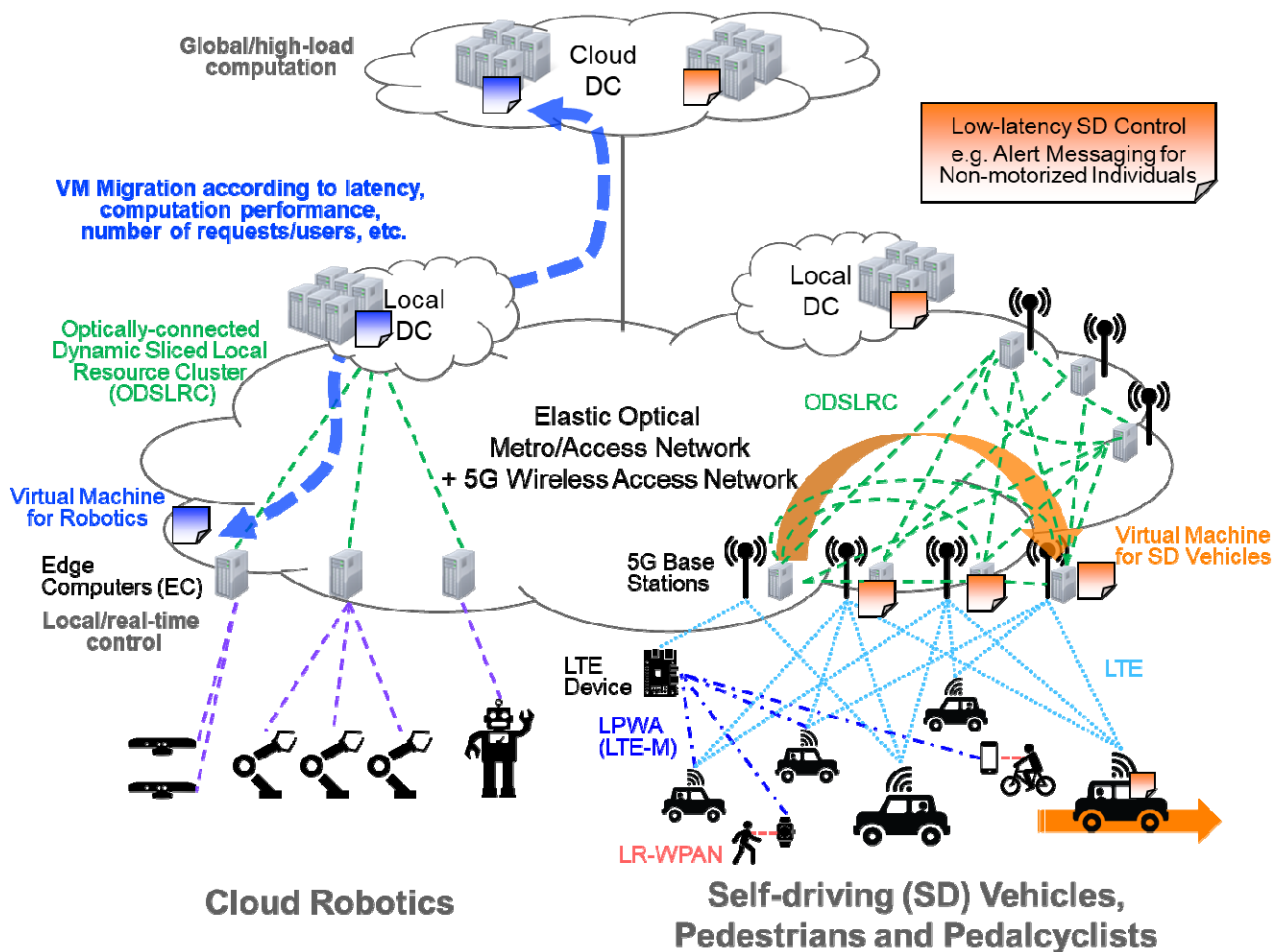
Naoaki Yamanaka<sup>1</sup>, Satoru Okamoto<sup>1</sup>, Andrea Fumagalli<sup>2</sup>, Eiji Oki<sup>3</sup>, Takehiro Sato<sup>3</sup>, Malathi Veeraraghavan<sup>4</sup>, Takayuki Muranaka<sup>5</sup>

<sup>1</sup> Keio University, <sup>2</sup>University of Texas at Dallas, <sup>3</sup>Kyoto University, <sup>4</sup>University of Virginia, <sup>5</sup>Alaxala Networks

\*E-mail: [Yamanaka@ics.keio.ac.jp](mailto:Yamanaka@ics.keio.ac.jp); +81-(0)45-566-1744

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- I. Autonomous Drive Vehicles or ADVs are designed to prevent collisions and injuries. Besides AV autonomous robots are expected to operate in public spaces while being assisted from the Cloud. Safety of non-motorized individuals is and will remain a concern. In our proposal we envision a Smart and Connected Community or S&CC co-hosting three types of IoT endpoints: i) robots, ii) autonomous/connected vehicles, and iii) non-motorized individuals for example pedal cyclists and or pedestrians. We assume that all three types of IoT endpoints will have some form of computing and communication devices and will receive assistance



## Proposed ODSLRC architecture of trustworthy elastic optical networks

and services that are provided by applications running in possibly remote Cloud Data Centers DCs, local DCs, and Edge Computing EC. All data and information are corrected by the network and make suggested route or control action based on learning technique. Applications requiring short response times will make use of EC that is in the proximity of the endpoint. Each IoT endpoint type will rely on its own pool of applications which are specifically designed to assist that endpoint type. We propose to study algorithms and network protocols for a resilient design of elastic optical network with edge computing to offer sustained S&CC services in the presence of failures, disruptions, and traffic surges. Application processes, containers and Virtual Machines (VMs) will be optimally placed and in some instances live migrated along the road infrastructure to retain the geographical proximity with the moving IoT endpoint. Field test-beds will be deployed: a permanent one in the US hosting newly designed roadside stations that will provide monitoring capabilities as part of the infrastructure and a temporary one in Japan focusing on an AV with open APIs made available to the researchers of the project who will test their proposed solutions. In addition, demonstration results supporting to the autonomous Vehicle along with edge computer VM migration by flexible and programable edge router node are also described.

### References

- 1) N. Yamanaka et.al. Keynote talk, APSCIT 2018 Annual Meeting, July 19-23, 2018