

# Structure of Japanese Inter-firm Multiplex Networks

Yohei Kondo<sup>\*1</sup>, Hideki Takayasu<sup>1, 2, 3</sup>, Misako Takayasu<sup>1, 3</sup>

<sup>1</sup>Department of Mathematical and Computing Science, School of Computing, Tokyo Institute of Technology, 4259, Nagatsutacho, Yokohama 226-8502, Japan

<sup>2</sup>Sony Computer Science Laboratories, 3-14-13, Higashi-Gotanda, Shinagawa-ku, Tokyo 141-0022, Japan

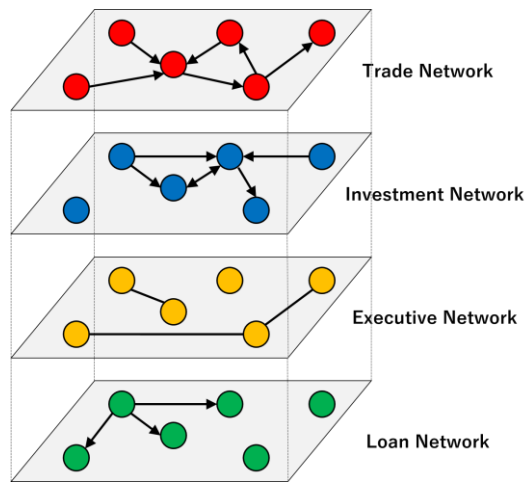
<sup>3</sup>Institute of Innovative Research, Tokyo Institute of Technology, 4259, Nagatsutacho, Yokohama 226-8502, Japan

E-mail: \*kondo.y.av@m.titech.ac.jp

Keyword: Multiplex Networks, Inter-firm Network

The data we analyzed are composed of Japanese inter-firm multiplex networks, such as a trade network, an investment network, an executive network and a loan network between banks and firms (Fig.1). In this presentation, we report detail network structural properties of each network layer, and analyze the whole multiplex network properties. Underlying interaction among layers will be pointed out.

Fig.1 Inter-firm Multiplex Networks



## References

- [1] M. Matsuzaki, H. Takayasu and M. Takayasu, “Analysis of statistical properties in Inter-firm Investment network”, in preparation.
- [2] Y. Fujiwara, H. Aoyama, Y. Ikeda, H. Iyetomi and W. Souma, “Structure and Temporal Change of the Credit Network between Banks and Large Firms in Japan”, *Economics: The Open-Access, Open-Assessment E-Journal*, Vol.3, 2009-7, (2009).
- [3] S. V. Buldyrev, R. Parshani, G. Paul, H. E. Stanley and S. Havlin, “Catastrophic cascade of failures in interdependent networks”, *Nature* 464, 1025-1028, (2010).