AI Research Highlights for COVID-19 Mitigation (Overview) As of Nov 25, 2020

《 Detecting and treating infection by AI 》

〈 Protein analysis, medicine search assessment 〉

- Participation in CASP_Commons ROUND2-2020(SARS-2-CoV targets) (National Institute of Advanced Industrial Science and Technology)
- Structure prediction and their quality assessment of SARS-2-CoV proteins (Tokyo Tech)
- Rapid safety prediction of antiviral drugs using machine learning with ES/iPS cells (Kyoto Univ)
- Repositioning of COVID-19 drug using tensor decomposition based unsupervised feature extraction (CHUO UNIVERSITY)

〈 Knowledge acquisition and search 〉

- Knowledge Acquisition from COVID-19 related articles (National Institute of Advanced Industrial Science and Technology)

〈 Inspection support 〉

- Autonomous robots for sure specimen collection of PCR tests (Tohoku Univ)

〈 Support for emergency medical treatment, optimized plan 〉

- Accurate decision of emergency medical services using Graph Neural Networks (Tokyo Tech)
- Plans for transportation with minimum travel distance to prevent medical collapse(Challenge 1) (Tohoku Univ)

  Resource Allocation Plan for More Accurate Patient Counting (Challenge 2)(Tohoku Univ)

  Plan for Hospital/accommodation location according to the stage of patient symptoms and transportation plan of goods (Challenge 3) (Tohoku Univ)

  Plan to close public facilities and commercial facilities and resume operations after requesting leave(Challenge 4)(Tohoku Univ)

《 Transmission suppression of infection disease, grasping human social behavior by AI 》

〈 Epidemiology and infection prediction 〉

- Relationship between COVID-19 death toll doubling time and national BCG vaccination policy(Tokyo Tech)
- Research on centrality of temporal networks for preventing disease spread (Tokyo Tech)
- The K indicator epidemic model follows the Gompertz curve (Tokyo Tech)

〈 Behavior grasping, behavior modification 〉

- Formulation of individually optimized schedules to avoid congestion in commercial facilities (Challenge 6) (Tohoku Univ)

〈 Infection simulation 〉

- COVID-19 Transmission Simulation Across Japan with Human Mobility Data (National Institute of Advanced Industrial Science and Technology)
- Agent-based simulation for propagation of infection with social networks of people (Kyushu Univ)
- COVID-19 Pandemic AI Prediction Using Graph Theory (Tohoku Univ)

〈 Social behavior analysis 〉

- A Study of Discrimination and Prejudice during COVID-19 pandemic (Tohoku Univ)

《 Infection disease control by AI 》

- Free Provision of ABCI, a cloud-based computing system for AI, to support research related to the new coronavirus (National Institute of Advanced Industrial Science and Technology)
- A Remote/Autonomous Robot Operation Technology for Laboratory of Infectious Diseases (National Institute of Advanced Industrial Science and Technology)

《 Others 》

- Robots/drones for unmanned disinfection in contaminated areas (Tohoku Univ)
- Image analysis using for the understanding of the supply chain status (National Institute of Advanced Industrial Science and Technology)

《 AI usage for remote circumstance enhancement 》

〈 Education, medical care, nursing care, health and so on 〉

- Estimation of learner's attentional states with AI analyses of face and body images (Tohoku Univ)
- Improvement of home remote health maintenance and promotion environment by AI service system (National Institute of Advanced Industrial Science and Technology)

〈 Telework, business 〉

- Augmented Telework-Technologies for a New Workstyle in a Post-Corona Society (National Institute of Advanced Industrial Science and Technology)
- Development of a remote environment for experience sharing using an AI service system (National Institute of Advanced Industrial Science and Technology)
- Realization of acoustic telework environment for intellectual activity (Tohoku Univ)
- Dynamic Haptic User Interface AI for Realistic Room-scale VR World (Tohoku Univ)
- Formulation of office/remote work schedule with communication opportunities (Challenge 5) (Tohoku Univ)

〈 Robot, remote circumstance enhancement 〉

- Analysis and demonstration of robotic tasks that mediate human tasks essential to our life (National Institute of Advanced Industrial Science and Technology)

(Note 1) **Red boxes**: Established technology, industrial use **Yellow boxes**: Research and development stage **Green boxes**: Plan for research project **Blue boxes**: Idea level research based on his/her own technologies

(Note 2) This classification is by AI Japan R&D Network considering each research organization (university, public institute, etc.) and similar topics. Please refer to each research activity individually for more details of activity.