



GECCO 2018 보고

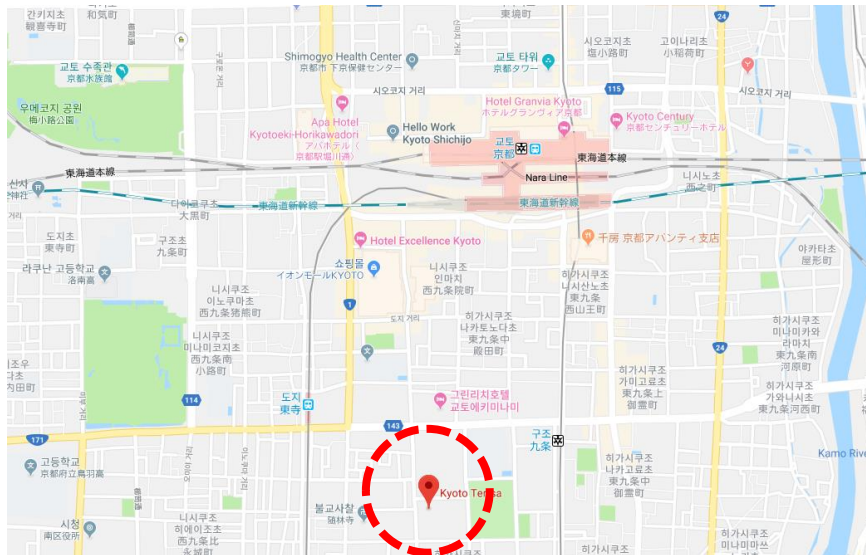
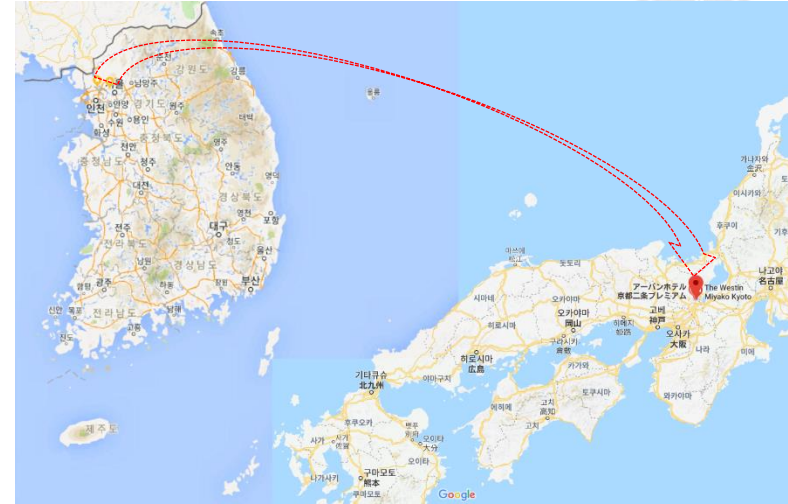
2018. 08. 06
서수인

- GECCO
 - The Genetic and Evolutionary Computation Conference
- Tracks (13 Topics)
 - Genetic Algorithms (GA)
 - Genetic Programming (GP)
 - General Evolutionary Computation and Hybrids (GECH)
 - Complex Systems (CS)
 - Ant Colony Optimization and Swarm Intelligence (ACO-SI)
 - Digital Entertainment Technologies and Arts (DETE)
 - Evolutionary Machine Learning (EML)
 - Evolutionary Multiobjective Optimization (EMO)
 - Evolutionary Combinatorial Optimization and Metaheuristics (ECOM)
 - Evolutionary Numerical Optimization (ENUM)
 - Real World Applications (RWA)
 - Search-Based Software Engineering (SBSE)
 - Theory (THEORY)



Conference Info (cont.)

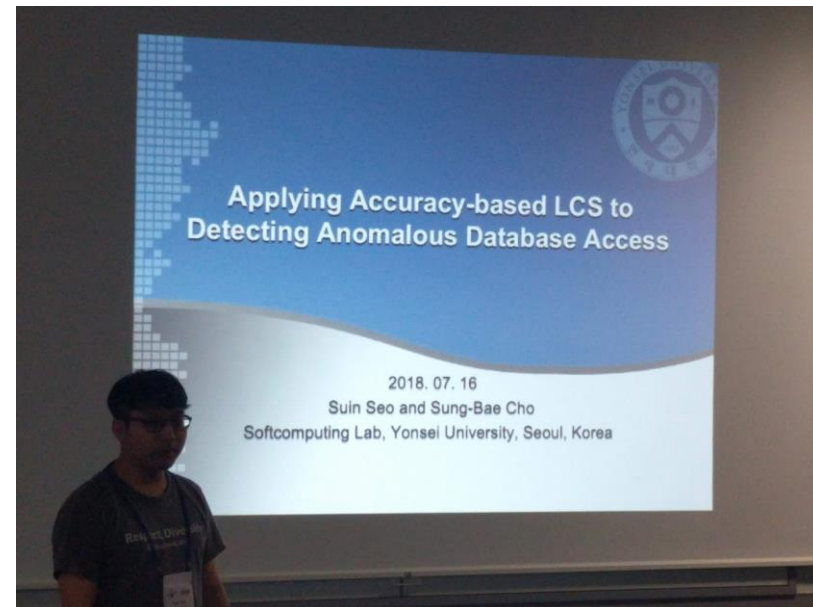
- GECCO2018
 - 27th GECCO
 - Kyoto Terrsa (京都 テルサ), Kyoto, Japan
 - 2018. 07. 15 ~ 19 (5 days)
 - Hot weather (37°C) after typhoon
 - Flight: GMP → KIX
 - Train: Osaka stn. → Kyoto stn.





- 21 + 1 Workshops
- IWLCS
 - International Workshop on Learning Classifier Systems
 - 21st IWLCS in 27th GECCO
 - Biggest workshop (10 papers)
 - Research field of EML
 - 2018. 07. 16., 11:00 ~ 17:40 (2nd day)
- Topics
 - New approaches for modeling / partitioning rules / mixing classifiers
 - Evolutionary Reinforcement Learning
 - Theoretical Developments in LCS
 - Explainable A.I.
 - Applications *
 - Optimizations and Parallel implementations
 - Other Rule-based Machine Learning Systems

- Paper
 - Applying Accuracy-based LCS to Detecting Anomalous Database Access (DB-IDS)
- Presentation
 - 2nd presentation of workshop (11:30~)
 - 20 min presentation
 - 5 min Q&A
 - 20~25 Listeners
 - Quite and Concentrated
 - Not fully understand of the previous paper
 - Generate classifiers (rules) of LCS by reinforcement learning
 - RF + LCS
 - But not well explain the validity of using reinforcement learning in rule generation





- 3 Questions

Q. How the algorithm actually detect the anomaly?

–by Danilo Vasconcellos Vargas (Kyushu Univ.)

A. If the model classify the query as unknown class, we consider the input as anomaly.

Q. Though the Deletion threshold is 2, didn't classifiers lose their information?

–by Will Neil Browne (Victoria Univ. of Wellington)

A. As you can see in the chart, the classifier didn't lose their information although the deletion threshold is 2, matching with conditions.

Q. Explain about the differences between the compared targets.

–by Jason Moore (Univ. of Pennsylvania)

A. In training process, the accuracy of the classifier is rapidly increase in only one epoch, so we compared that points to find what factors affects to the increase of performances.



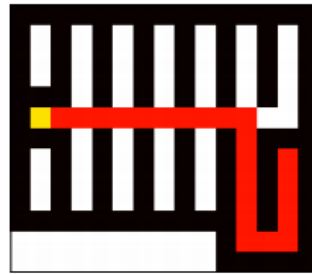
Interesting paper

- Gradient of EN
 - Safe Mutations for Deep and Recurrent Neural Networks through Output Gradients, J. Lehman et al., Uber AI Labs
- Neuroevolution (evolving NN)
 - Apply genetic algorithm on neural network
 - Random mutation breaks functionality of weights of network
- Approaches
 - Choose weight perturbations
 - Safe mutation through rescaling
 - Safe mutation through gradients
- Results
 - Reach optimal solution faster than evolution strategy (ES) of Salimans et al., 2017.

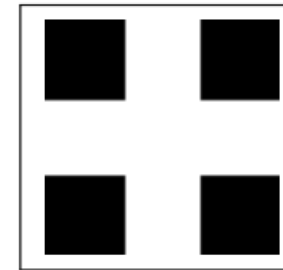
Interesting paper (cont.)

- Problem

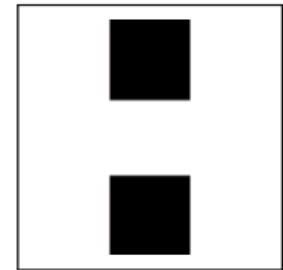
- Top-down maze
- 2 States
 - Intersection
 - Inbetween



(a) Map



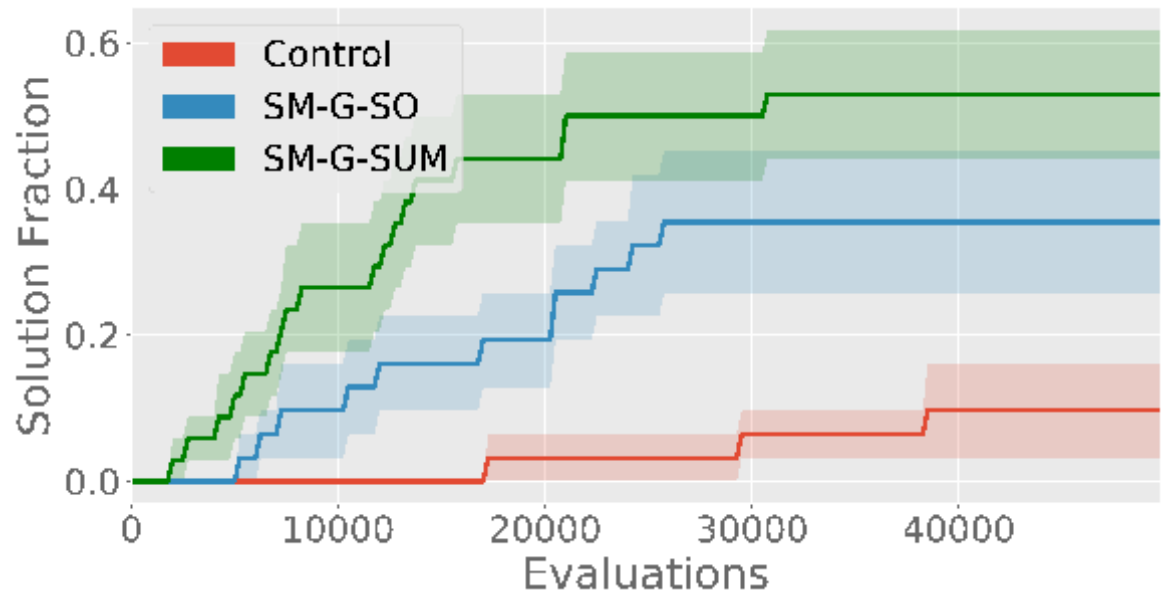
(b) Intersection



(c) Inbetween

- Performance

- Find faster solution than previous one





- Parameter tuning
 - Adaptive Parameter Choices in Evolutionary Computation (C. Doerr, CNRS and Sorbonne University)
 - Introducing many methods for (dynamic) parameter tuning
 - State-Dependent Parameter Selection
 - Success-Based Parameter Selection
 - Learning-Inspired Parameter Selection
- Evolutional NN
 - Evolutionary Computation and Evolutionary Deep Learning for Image Analysis, Signal Processing and Pattern Recognition (M. Zhang)
 - Apply GA for constructing CNN architecture for CV (Object tracking)

