Processing Medical Image by New Learning Rules of Cellular Neural Networks based Reinforcement Optimization

Over the last decade, numerous methods for medical image processing has been developed within different theoretical and intelligent frameworks. These method doesn't take into account the spatial arrangement that evolved by time, which can be represented well by Cellular Neural Networks. Moreover, Computer-aided diagnosis for detection and classification on medical images is still suffering from hardware implementation constraints, which should be treated by an optimization techniques that take into account the time evolution. By this project, A hybrid of Cellular Neural Networks and Reinforcement Optimization, represented by Parallel Genetic Programming, are integrated to overcome some of these problems by discovering new supervised learning rules for Cellular Neural Networks that takes into account the hardware implementation constraints. Parallel Genetic Programming is chosen not only for its ability to discover the values of learning rule parameters but also for its ability to discover the optimal number of parameters and the form of the admissible rules. Also, Parallel Genetic Programming handles multi-objective fitness function that take into account the hardware constraints. By this project, a new supervised learning algorithm should be discovered. Also, a comparative study with other different methods should be appeared.

Index Words: Medical Image Processing, Cellular Neural Networks, Reinforcement optimization, Parallel Genetic Programming, Supervised Learning Rules, Multi-objective fitness function.