Partitioning for High Performance of Predicting Dynamical Behavior of Color Diffusion in Water Using 2-D Tightly Coupled Neural Cellular Network[*]

A. Suratanee[1], K. Na Nakornphanom[1], K. Plaimas[1], and C. Lursinsap[1]

Abstract: The 2-D tightly coupled neural cellular network is developed to simulate the diffusion characteristics of colored liquid dropped onto water surface by generating its own diffusion image. To learn the diffusion characteristics, a large training set was divided into data subsets by extracting the significant feature patterns of the diffusion and simultaneously training the neural cellular network individually. Using this technique for reducing the training-time, increasing the performance, and facilitating the recognition of large data sets, many sub optimal neural networks were developed to replace of one network. Additionally, the result of the partitioning data achieved the speedup of 9.33 times for 12 networks and 600,000 data patterns. The accuracy of the simulated behaviour is more than 90 percent compared with the actual event.

[1] The Advanced Virtual and Intelligent Computing Center (AVIC)
Department of Mathematics, Faculty of Science, Chulalongkorn University,
10330 Bangkok, Thailand
asuratanee@yahoo.com, kplaimas@yahoo.com,
kodchakorn.n@student.chula.ac.th, lchidcha@chula.ac.th