

## Accepted Manuscript

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PII: S0925-2312(17)30436-8  
DOI: [10.1016/j.neucom.2016.10.085](https://doi.org/10.1016/j.neucom.2016.10.085)  
Reference: NEUCOM 18186



To appear in: *Neurocomputing*

Received date: 25 April 2016  
Revised date: 28 August 2016  
Accepted date: 31 October 2016

Please cite this article as: Mutsumi Kimura , Ryohei Morita , Sumio Sugisaki , Tokiyoshi Matsuda , Tomoya Kameda , Yasuhiko Nakashima , Cellular Neural Network formed by Simplified Processing Elements composed of Thin-Film Transistors, *Neurocomputing* (2017), doi: [10.1016/j.neucom.2016.10.085](https://doi.org/10.1016/j.neucom.2016.10.085)

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# Cellular Neural Network formed by Simplified Processing Elements composed of Thin-Film Transistors

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*Keywords:* Cellular neural network, Processing element, Thin-film transistor (TFT), Logic learning, Letter recognition

## ABSTRACT

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We have developed a cellular neural network formed by simplified processing elements composed of thin-film transistors. First, we simplified the neuron circuit into a two-inverter two-switch circuit and the synapse device into only a transistor. Next, we composed the processing elements of thin-film transistors, which are promising for giant microelectronics applications, and formed a cellular neural network by the processing elements. Finally, we confirmed that the cellular neural network can learn multiple logics even in a small-scale neural network. Moreover, we verified that the cellular neural network can simultaneously recognize multiple simple alphabet letters. These results should serve as the theoretical bases to realize ultra-large scale integration for brain-type integrated circuits.

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