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## Application of the RNN in the fundamental physics with KamLAND experiment

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The development of the machine learning in recent years has begun to benefit the fundamental physics research. In the neutrino detector KamLAND aiming to unravel the mysteries of the universe, discriminating gamma-ray that inhibits the signal has been ultimate task. This research made it possible by using recurrent neural networks (RNN).

### Recent Publications

1. A. Gando et al. "Search for Majorana Neutrinos Near the Inverted Mass Hierarchy Region with KamLAND-Zen", *Physical Review Letters* 117, p.082503 (2016)
2. A. Gando et al. "A Search for electron antineutrinos associated with gravitational wave events GW150914 and GW151226 using KamLAND", *The Astrophysical Journal Letters*, Volume 829, Number 2 (2016)
3. A. Gando et al. "Search for double-beta decay of  $^{136}\text{Xe}$  to excited states of  $^{136}\text{Ba}$  with the KamLAND-Zen experiment", *Nuclear Physics A*, Volume 946 p.171-181 (2016).

### Biography

Shingo Hayashida is a research fellow of the Japan Society for the Promotion of Science (JSPS). He is expected to take PhD from Tohoku University in Japan in March 2019. He has published 6 papers in reputed journals.

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