

Themes of technology implementation reports (TIR) for
independent study of cognitive systems.
(13541/7, 13541/8)

The TIR should consist of 2 parts:

- Review on the subject of the report;
- Instruction on how to implement one of reviewed technologies in practice. Use real or abstract sample of the implementation for illustration purposes.

LabVIEW and MATLAB facilities should be taken into account.

Send selected topic by e-mail to **spbspu2012@gmail.com**

Discussion of the TIR is a part of the exam.

1. Technologies of a priori and a posteriori processing for cognition-based system design.
3. Programming of tactics and strategy for cognition-based systems.
4. Indexing of vector signals using pattern recognition. Signal databases.
5. Stereovision. Simultaneous localization and mapping (Gross C. - 2, Taranovsky A. - 5).
6. Recording of action as image. Image as a stimulus to action.
7. Multiagent software tools for cognition-based system design.
8. Models of mind. Semantic recognition (Taranovsky A. - 3).
9. Parallel computing using clusters or clouds technologies for cognition tasks.
12. Kohonen maps (Voelker H. - 2).
14. Associative memory models (Voelker H. - 3, Taranovsky A. - 4).
16. Cognitive radio.
18. Electronic nose.
19. Electronic skin (Gross C. - 3).
21. Automatic text classification (Denni M. -3).
22. Recognition of the group object. Swarm of agents (Aakif N. - 2).
23. Precursor detection.
24. Neurological systems.
26. Phase portrait of vector signal.
28. Symbolic regression.
29. Neural networks with deep learning.
30. Specialized programming languages for the development of cognitive systems (Teng G. -3).
34. Own topic.
2. Software, hardware and brainware for real-time cognition tasks (Taranovsky A. - 1).
10. Models of short- and long-term memory. Forgetting (Teng G. -2, **Assiri H.**, Taranovsky A. - 2).
11. Support vector machines (Teng G. -1).
13. Data mining (Voelker H. - 1).
15. Unmanned vehicles (Gross C. - 4, **Zhang J.**).
17. Robocup (Aakif N. - 1).
20. Brain-computer interface (BCI) (Cáceres C.).
25. Fuzzy neurons (Gross C. - 1).
27. Genetic algorithms (**Arbash E.**, Denni M. -2).
31. Any-time algorithms to solve cognitive tasks in real time (Denni M. -1).
32. Reinforcement learning (Bisht L.).
33. Convolution neural network for object detection (Xu Y.)