

Sprint0: Choosing a Topic

YueLiu

Area	Topic
Machine Learning	State of the ART of machine learning models to detect a segment objects
	State of the art of unsupervised learning and where it is being currently used
Security	Study open-source security frameworks including pros and cons and applicable usage for such frameworks.
Speech Processing	State of the art of multi-speaker identification (using signal processing and neural networks)
	My topic2: Neural Network use in DSP (e.g., compared to transforms, Kalman filtering, etc.)
Robotics	Study or ROS. Can we do out-of-the-box self-driving wheelchair using what is in ROS in open source and if not, what is missing

Machine Learning

State of the ART of machine learning models to detect a segment objects

In Andreetto et al (2011), the object is the set of segments of the images. It is important to introduce the human test in the unsupervised learning.

Andreetto, M., Zelnik-Manor, L., & Perona, P. (2011). Unsupervised learning of categorical segments in image collections. *IEEE transactions on pattern analysis and machine intelligence*, 34(9), 1842-1855.

My topic1: State of the art of unsupervised learning and where it is being currently used

→ Sounds reasonable according to the status of term project, we are stuck in the unsupervised learning part.

Security

Study open-source security frameworks

including pros and cons and applicable usage for such frameworks.

A new approach, blockchain is introduced at the very beginning of the article. It is correct blockchain will speed up the process of signing the contract.

Raikwar, M., Mazumdar, S., Ruj, S., Gupta, S. S., Chattopadhyay, A., & Lam, K. Y. (2018, February). A blockchain framework for insurance processes. In *2018 9th IFIP International Conference on New Technologies, Mobility and Security (NTMS)* (pp. 1-4). IEEE.

Speech Processing

State of the art of multi-speaker identification (using signal processing and neural networks)

An interesting application of speech processing! We can collect the data manually. The very good

thing for the article is to encourage me to read a handbook of math symbols.

Ouamour, S., & Sayoud, H. (2013, October). Speaker detection on telephone calls using fusion between SVMs and statistical measures. In *2013 International Conference on Cyber-Enabled Distributed Computing and Knowledge Discovery* (pp. 287-293). IEEE.

My topic2: Neural Network use in DSP

(e.g., compared to transforms, Kalman filtering, etc.)

No one can literally get rid of the original major, the topic is good as a back-up.

Robotics

Study or ROS. Can we do out-of-the-box self-driving wheelchair

using what is in ROS in open source and if not, what is missing

What does ROS mean? We cannot have a self-driving car, regardless of the wheelchairs.

The Robotic Operating System (ROS) is an open source Linux based framework for operating robots. Learning about OS is a must...

Mishra, R., & Javed, A. (2018, April). ROS based service robot platform. In *2018 4th International Conference on Control, Automation and Robotics (ICCAR)* (pp. 55-59). IEEE.