(Pending) Network Issues of Federated Learning

Sami Ma - 301 251 923

December 29, 2020

Automated Analysis of Wild Fish Behavior in a Natural Habitat [1]

•

An Application of Image Classification to Saltwater Fish Identification in Louisiana Fisheries [2]

- Tensorflow: Transfer Learning with Inception-v3
- 14 million fish images with over 20,000 categories

Employing Deep Learning for Fish Recognition [3]
Tracking Fish Abundance by Underwater Image Recognition [4]
Fish detection automation from ARIS and DIDSON SONAR data [5]

- Background subtraction (Maybe ARIS software can help?)
- Preprocessing
  - Reduce framerate
  - Reduce RGB/HSV to grayscale
- Tracking alg used is Kalman filtering - predicts future observations according to previous measurements

Deep Neural Networks for Marine Debris Detection in Sonar Images [6]

- CNN used
  - ClassicNet
  - TinyNet
  - FireNet
- ADAM optimizer with initial learning rate $\alpha = 0.01$
- Transfer Learning

Can help with converting ARIS files to videos:
`https://github.com/EminentCodfish/pyARIS`

References

[1] N. X. R. Wang, S. Cullis-Suzuki, and A. Branzan Albu, "Automated analysis of wild fish behavior in a natural habitat," in *Proceedings of the 2nd International Workshop on Environmental Multimedia Retrieval*, EMR '15, (New York, NY, USA), p. 2126, Association for Computing Machinery, 2015.

[2] N. Manandhar and J. W. Burris, "An application of image classification to saltwater fish identification in louisiana fisheries," in *Proceedings of the 2019 3rd International Conference on Information System and Data Mining*, ICISDM 2019, (New York, NY, USA), p. 129132, Association for Computing Machinery, 2019.

[3] A. Reithaug, "Employing deep learning for fish recognition," Master's thesis, The University of Bergen, 2018.

[4] S. Marini, E. Fanelli, V. Sbragaglia, E. Azzurro, J. Del Rio Fernandez, and J. Aguzzi, "Tracking fish abundance by underwater image recognition," *Scientific Reports*, vol. 8, p. 13748, Sep 2018.

[5] M. Ghobrial, "Fish detection automation from aris and didson sonar data," Master's thesis, University of Oulu, 2019. `http://urn.fi/URN:NBN:fi:oulu-201906262667`.

[6] M. Valdenegro-Toro, "Deep neural networks for marine debris detection in sonar images," *CoRR*, vol. abs/1905.05241, 2019.