

Project Options – Key topics to choose from

(Use Google Scholar to find more relevant papers)

1. Text analytics – Problems include question-answering, e-mail categorization, word perception, context processing
 - a. Devlin, J., Chang, M. W., Lee, K., & Toutanova, K. (2018). Bert: Pre-training of deep bidirectional transformers for language understanding. *arXiv preprint arXiv:1810.04805*.
 - b. Tenney, I., Das, D., & Pavlick, E. (2019). Bert rediscovers the classical nlp pipeline. *arXiv preprint arXiv:1905.05950*.
 - c. Zhang, Z., Robinson, D., & Tepper, J. (2018, June). Detecting hate speech on twitter using a convolution-gru based deep neural network. In *European Semantic Web Conference* (pp. 745-760). Springer, Cham.
 - d. Yin, W., Kann, K., Yu, M., & Schütze, H. (2017). Comparative study of CNN and RNN for natural language processing. *arXiv preprint arXiv:1702.01923*.
2. Image analytics – Pose detection, object detection
 - a. Toshev, A., & Szegedy, C. (2014). Deeppose: Human pose estimation via deep neural networks. In *Proceedings of the IEEE conference on computer vision and pattern recognition* (pp. 1653-1660).
 - b. Zhao, L., & Thorpe, C. E. (2000). Stereo-and neural network-based pedestrian detection. *IEEE Transactions on intelligent transportation systems*, 1(3), 148-154.
 - c. Farfade, S. S., Saberian, M. J., & Li, L. J. (2015, June). Multi-view face detection using deep convolutional neural networks. In *Proceedings of the 5th ACM on International Conference on Multimedia Retrieval* (pp. 643-650). ACM.
 - d. Szegedy, C., Toshev, A., & Erhan, D. (2013). Deep neural networks for object detection. In *Advances in neural information processing systems* (pp. 2553-2561).
 - e. Redmon, J., Divvala, S., Girshick, R., & Farhadi, A. (2016). You only look once: Unified, real-time object detection. In *Proceedings of the IEEE conference on computer vision and pattern recognition* (pp. 779-788).
3. Feature extraction – Autoencoders for image or IoT data
 - a. Hinton, G.E., & Salakhutdinov, R. (2006). Reducing the dimensionality of data with neural networks. *Science*, 313 5786, 504-7.
 - b. Liang, Y., Niu, D., & Hong, W. C. (2019). Short term load forecasting based on feature extraction and improved general regression neural network model. *Energy*, 166, 653-663.
 - c. Rifai, S., Vincent, P., Muller, X., Glorot, X., & Bengio, Y. (2011, June). Contractive auto-encoders: Explicit invariance during feature extraction. In *Proceedings of the 28th International Conference on International Conference on Machine Learning* (pp. 833-840). Omnipress.
 - d. McCabe, A., Trevathan, J., & Read, W. (2008). Neural network-based handwritten signature verification. *Journal of computers*, 3, 9-22.
 - e. Reagen, B., Whatmough, P., Adolf, R., Rama, S., Lee, H., Lee, S. K., ... & Brooks, D. (2016, June). Minerva: Enabling low-power, highly-accurate deep neural network accelerators. In *2016 ACM/IEEE 43rd Annual International Symposium on Computer Architecture (ISCA)* (pp. 267-278). IEEE.
4. Data transformation and pattern recognition
 - a. Yan, X., Ai, T., Yang, M., & Yin, H. (2019). A graph convolutional neural network for classification of building patterns using spatial vector data. *ISPRS journal of photogrammetry and remote sensing*, 150, 259-273.

- b. Sánchez, P. A. S., González, J. R. G., Fajardo-Toro, C. H., & Sánchez, P. M. T. M. (2020). Designing a Neural Network Model for Time Series Forecasting. In *Theoretical and Applied Mathematics in International Business* (pp. 259-284). IGI Global.
 - c. Corkery, M., Matusevych, Y., & Goldwater, S. (2019). Are we there yet? Encoder-decoder neural networks as cognitive models of English past tense inflection. *arXiv preprint arXiv:1906.01280*.
 - d. Sridhar, K. P., Baskar, S., Shakeel, P. M., & Dhulipala, V. S. (2019). Developing brain abnormality recognize system using multi-objective pattern producing neural network. *Journal of Ambient Intelligence and Humanized Computing*, 10(8), 3287-3295.
5. IoT data analytics and signal processing – Sensor data analytics from cell phones for fall detection, car routing, smart vehicular data analytics
- a. Mohammadjafari, S., Kavurmacioglu, E., Maidens, J., & Bener, A. (2019, April). Neural Network Based Spectrum Prediction in Land Mobile Radio Bands for IoT deployments. In *2019 IFIP/IEEE Symposium on Integrated Network and Service Management (IM)* (pp. 31-36). IEEE.
 - b. Guo, K., Li, T., Huang, R., Kang, J., & Chi, T. (2018). DDA: A deep neural network-based cognitive system for IoT-aided dermatosis discrimination. *Ad Hoc Networks*, 80, 95-103.
 - c. Alam, M. G. R., Abedin, S. F., Moon, S. I., Talukder, A., & Hong, C. S. (2019). Healthcare IoT-based Affective State Mining Using a Deep Convolutional Neural Network. *IEEE Access*.
 - d. Zhang, F., Martinez, C., Daniel, C., Cao, D., & Knoll, A. C. (2019). Neural network based uncertainty prediction for autonomous vehicle application. *Frontiers in neurorobotics*, 13, 12.
6. Other data analytics
- a. Lokesh, S., Kumar, P. M., Devi, M. R., Parthasarathy, P., & Gokulnath, C. (2019). An automatic tamil speech recognition system by using bidirectional recurrent neural network with self-organizing map. *Neural Computing and Applications*, 31(5), 1521-1531.
 - b. Nasser, I. M., Al-Shawwa, M. O., & Abu-Naser, S. S. (2019). Artificial Neural Network for Diagnose Autism Spectrum Disorder.
 - c. Solomon, I. A., Jatain, A., & Bajaj, S. B. (2019). Neural Network Based Intrusion Detection: State of the Art. Available at SSRN 3356505.
 - d. Wang, W., Zhao, M., & Wang, J. (2019). Effective android malware detection with a hybrid model based on deep autoencoder and convolutional neural network. *Journal of Ambient Intelligence and Humanized Computing*, 10(8), 3035-3043.
 - e. Jeong, J., Kwon, S., Hong, M. P., Kwak, J., & Shon, T. (2019). Adversarial attack-based security vulnerability verification using deep learning library for multimedia video surveillance. *Multimedia Tools and Applications*, 1-15.