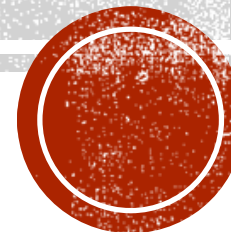


# INFORMATION THEORY AND CODING LABORATORY

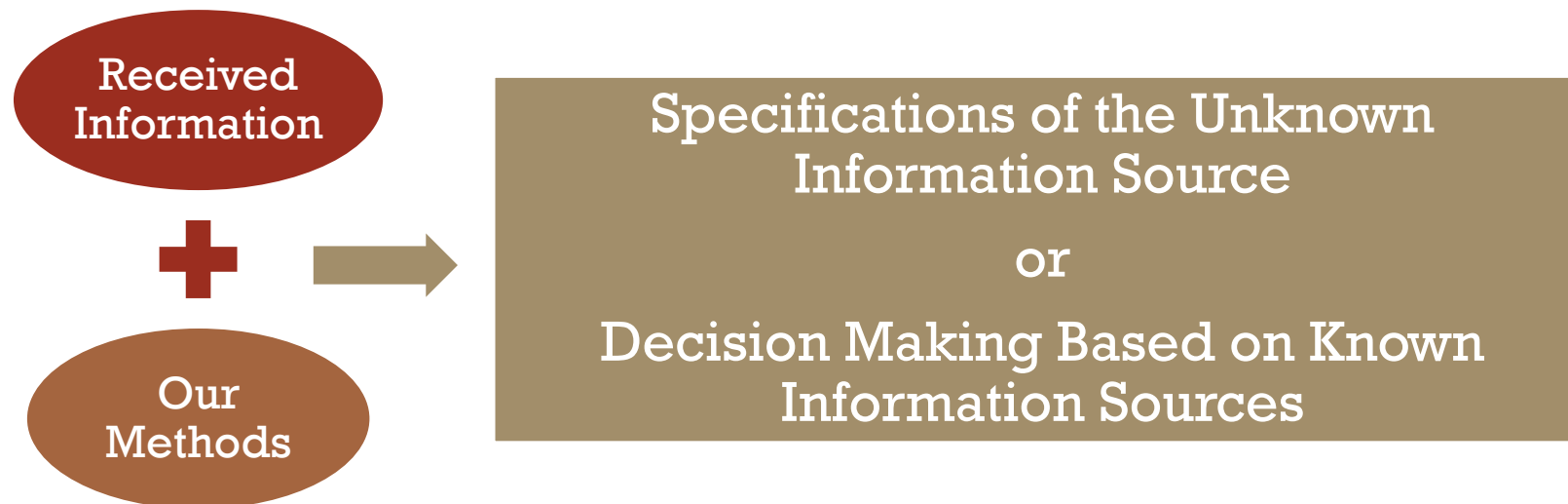
Mehdi Teimouri

December 2020



# GOALS

- Identification and Evaluation of Information Sources
  - Modeling and Simulation of Information Sources
  - Decision Support Systems for Identification of Information Sources
  - Decision Support Systems based on Known Information Sources



# CURRENT RESEARCHES



# MODERN FILE FRAGMENTS CLASSIFICATION

- Anomaly Detection
  - Anomaly Detection in Classification of Encoded Image Data
  - Anomaly Detection in Classification of Encoded Audio Data
- Large Scale File Fragments Classification
- Comprehensive Datasets for Practical File Fragments Classification

# NETWORK TRAFFIC CLASSIFICATION

- Encrypted and Unencrypted Network Traffic Classification

# REVERSE ENGINEERING OF UNKNOWN COMMUNICATIONS PROTOCOLS

- Clustering and Analysis of Network Packets
- Research Papers
  - M. Teimouri, H. R. Kakaei Motlagh, and J. Garshasbi, “Blind Identification of Communications Networks in Service Layer,” Passive Defense, vol. 10, no. 4, pp. 91-101, 2020 [in Persian]. Available at [pd.ihu.ac.ir](http://pd.ihu.ac.ir)

# BLIND RECONSTRUCTION OF CHANNEL CODES IN MODERN COMMUNICATIONS NETWORKS

- Packet Clustering Based on the Employed Channel Codes
- Reconstruction of Channel Codes from the Packets Containing Multiple Codewords
- Reconstruction of Channel Codes from the Packets Encoded with Multiple Channel Codes

# PAST RESEARCHES

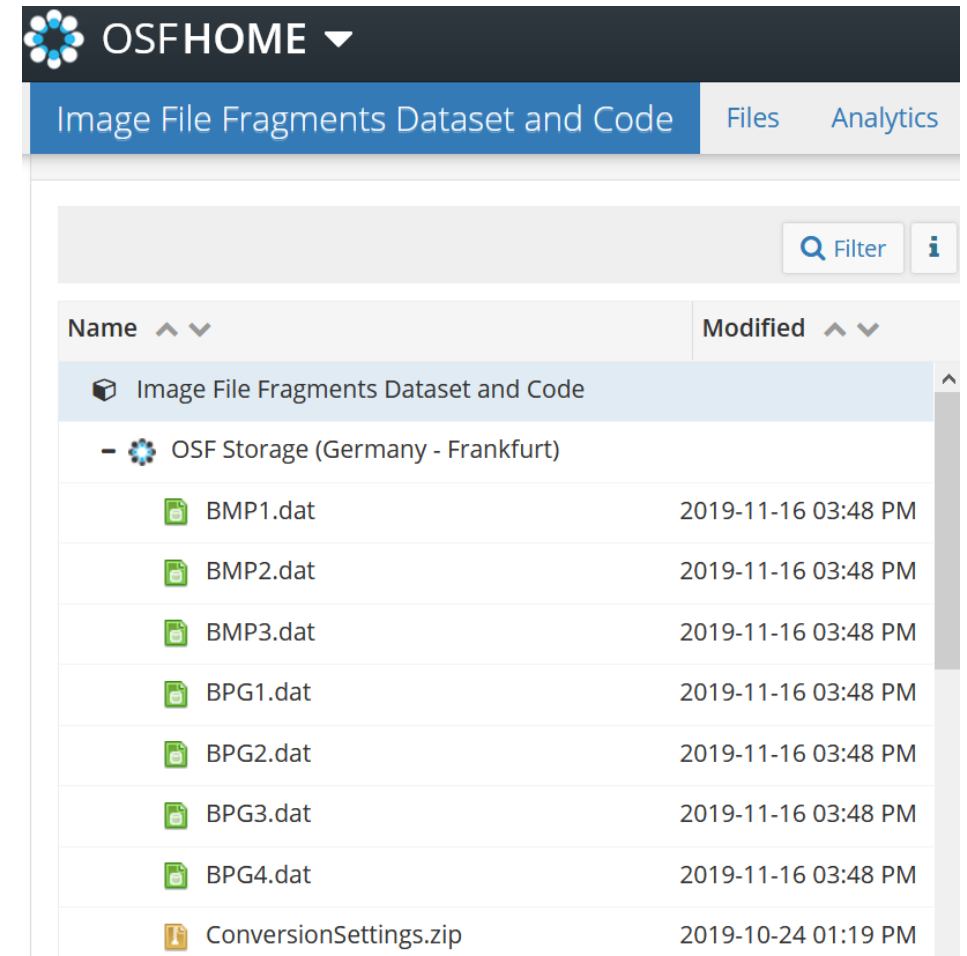




# FILE FRAGMENTS CLASSIFICATION

## ■ Datasets

- N. Sadeghi, M. Fahiminia and M. Teimouri, “Datase Dataset for file fragment classification of video file formats,” BMC Research Notes, vol. 13, pp. 1-3, 2020. DOI: [10.1186/s13104-020-05037-x](https://doi.org/10.1186/s13104-020-05037-x)
- A. Khodadadi and M. Teimouri, “Dataset for file fragment classification of audio file formats,” BMC Research Notes, vol. 12, pp. 1-3, 2019. DOI: [10.1186/s13104-019-4856-1](https://doi.org/10.1186/s13104-019-4856-1)
- F. Mansouri Hanis and M. Teimouri, “Dataset for file fragment classification of textual file formats,” BMC Research Notes, vol. 12, pp. 1-3, 2019. DOI: [10.1186/s13104-019-4837-4](https://doi.org/10.1186/s13104-019-4837-4)
- R. Fakouri and M. Teimouri, “Dataset for file fragment classification of image file formats,” BMC Research Notes, vol. 12, pp. 1-3, 2019. DOI: [10.1186/s13104-019-4812-0](https://doi.org/10.1186/s13104-019-4812-0)



OSFHOME ▾

Image File Fragments Dataset and Code Files Analytics

Filter ⓘ

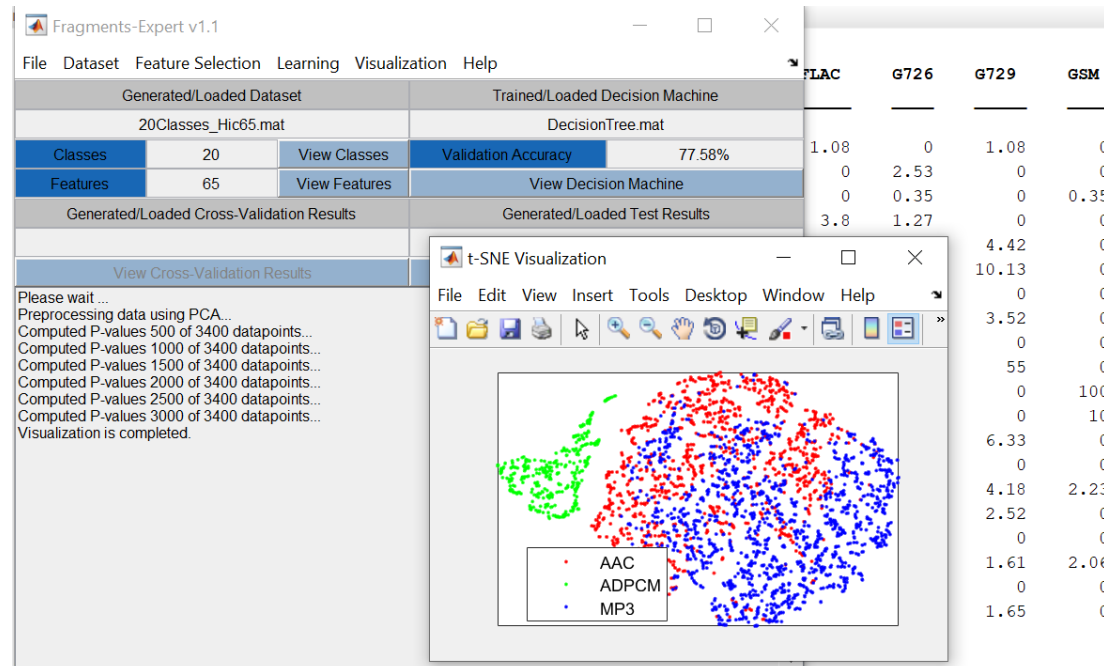
Name ▴ ▾	Modified ▴ ▾
Image File Fragments Dataset and Code	
- OSF Storage (Germany - Frankfurt)	
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BMP2.dat	2019-11-16 03:48 PM
BMP3.dat	2019-11-16 03:48 PM
BPG1.dat	2019-11-16 03:48 PM
BPG2.dat	2019-11-16 03:48 PM
BPG3.dat	2019-11-16 03:48 PM
BPG4.dat	2019-11-16 03:48 PM
ConversionSettings.zip	2019-10-24 01:19 PM

# FILE FRAGMENTS CLASSIFICATION (CONT.)

- Software

- <https://github.com/mehditeimouri-UT/Fragments-Expert>

- M. Teimouri, Z. Seyedghorban, and F. Amirjani, "Fragments-Expert: A graphical user interface MATLAB toolbox for classification of file fragments," *Concurrency and Computation: Practice and Experience*, First published: 23 December 2020. DOI: [10.1002/cpe.6154](https://doi.org/10.1002/cpe.6154).



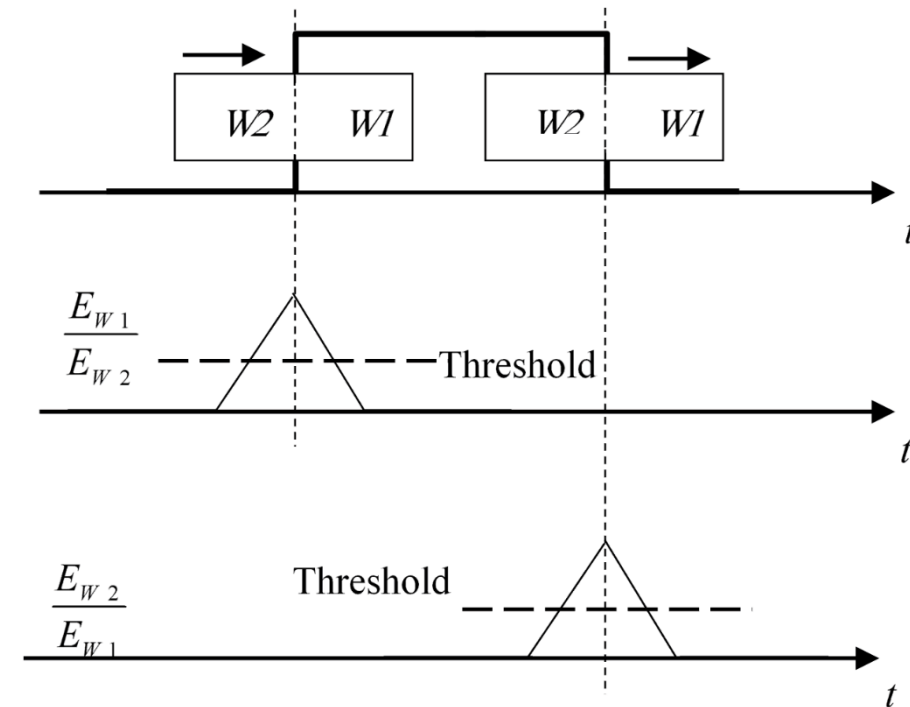
# FILE FRAGMENTS CLASSIFICATION (CONT.)

## ■ Research Papers

- A. Khodadadi, S. Molaei, M. Teimouri, and H. Zare, “Classification of audio codecs with variable bit-rates using deep-learning methods,” Digital Signal Processing, vol. 110, Article 102952, March 2021. DOI: [10.1016/j.dsp.2020.102952](https://doi.org/10.1016/j.dsp.2020.102952).
- Z. Seyedghorban and M. Teimouri, “Evaluating the Effect of Compression Settings in the Classification of Image File Formats,” in proc. ICCKE 2020, 29-30 Oct. 2020, Mashhad, Iran, pp. 312-316. DOI: [10.1109/ICCKE50421.2020.9303655](https://doi.org/10.1109/ICCKE50421.2020.9303655).
- A. Khodadadi and M. Teimouri, “Classification of Audio Codecs with Variable Bit- Rates,” in proc. ICCKE 2020, 29-30 Oct. 2020, Mashhad, Iran, pp. 050-054. DOI: [10.1109/ICCKE50421.2020.9303637](https://doi.org/10.1109/ICCKE50421.2020.9303637).
- M. Teimouri and N. Hoseini, “Classification of Image Codecs in Telecommunication Networks,” Tabriz Journal of Electrical Engineering, vol. 49, no. 1, pp. 79-87, 2019 [in Persian]. Available at [tabrizu.ac.ir](http://tabrizu.ac.ir)
- F. Jafari and M. Teimouri, “Classification of Audio Codecs in Telecommunication Networks,” Tabriz Journal of Electrical Engineering, vol. 49, no. 1, pp. 101-110, 2019 [in Persian]. Available at [tabrizu.ac.ir](http://tabrizu.ac.ir)

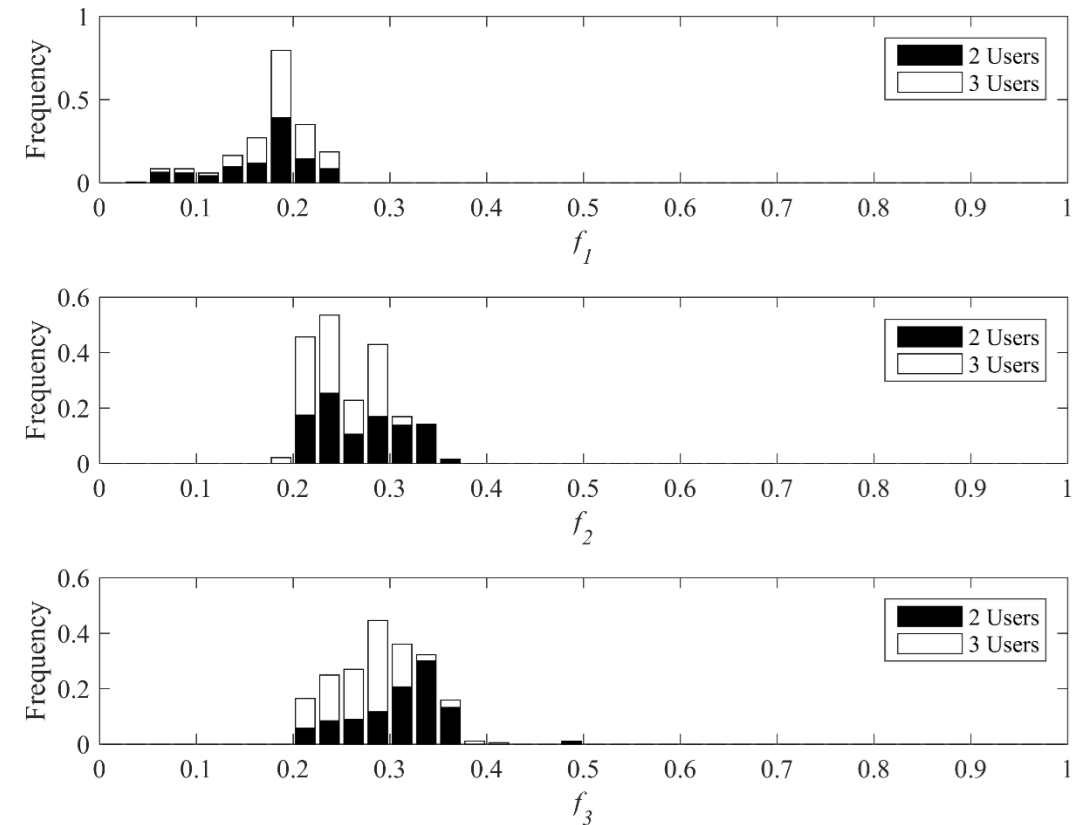
# BURST DETECTION AND SYNCHRONIZATION

- M. Zebarjadi and M. Teimouri, "Non-cooperative Burst Detection and Synchronization in Downlink TDMA-Based Wireless Communication Networks," IET communications, vol. 13, no. 7, pp. 863-872, 2019. DOI: [10.1049/iet-com.2018.5536](https://doi.org/10.1049/iet-com.2018.5536)
- M. Zebarjadi and M. Teimouri, "Blind Synchronization of TDMA Bursts in Non-Cooperative Environment," Tabriz Journal of Electrical Engineering, vol. 49, no. 1, pp. 201-211, 2019 [in Persian]. Available at [tabrizu.ac.ir](http://tabrizu.ac.ir)
- M. Zebarjadi and M. Teimouri, "Blind Detection of Burst Signals in Non-Cooperative Environment," Tabriz Journal of Electrical Engineering, vol. 47, no. 4, pp. 1465-1477, 2017 [in Persian]. Available at [tabrizu.ac.ir](http://tabrizu.ac.ir)
- M. Teimouri, "Blind Symbol Duration Estimation of Digitally Modulated Signals in the Presence of Carrier Frequency Offset," Advanced Defence Science and Technology, vol. 6, no. 1, pp. 1-7, 2015 [in Persian]. Available at [adst.ihu.ac.ir](http://adst.ihu.ac.ir)



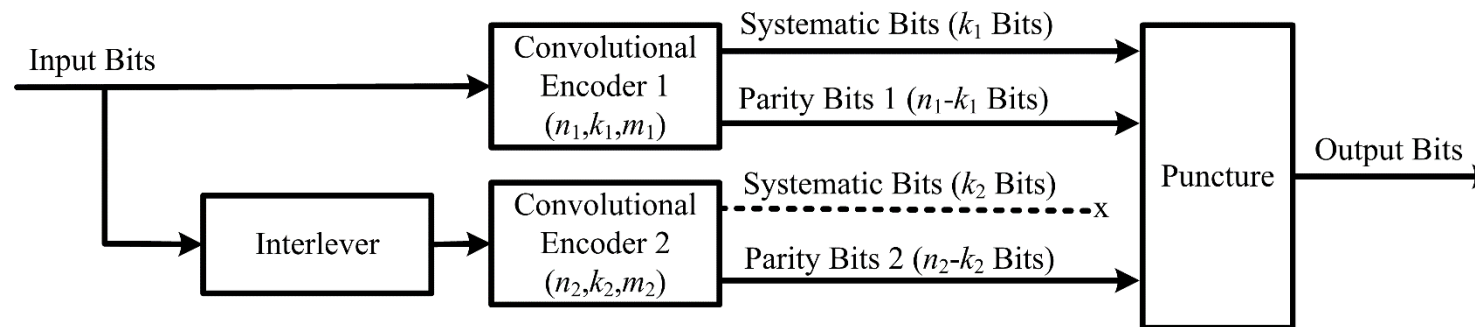
# MACHINE LEARNING FOR IDENTIFYING DATA LINK LAYER

- M. Teimouri and S. M. Ahmadiyan, “Estimating the number of users in TDMA networks based on redundancy of adaptive channel coding,” Digital Signal Processing, vol. 75, pp. 1-12, 2018. DOI: [10.1016/j.dsp.2017.12.006](https://doi.org/10.1016/j.dsp.2017.12.006)
- S. M. Ahmadiyan and M. Teimouri, “Blind Estimation of Number of Users in TDMA Networks Using Redundancy of Adaptive Channel Coding,” Journal of Electronical & Cyber Defence , vol. 6, no. 2, pp. 11-20, 2018 [in Persian]. Available at [ecdj.ihu.ac.ir](http://ecdj.ihu.ac.ir)



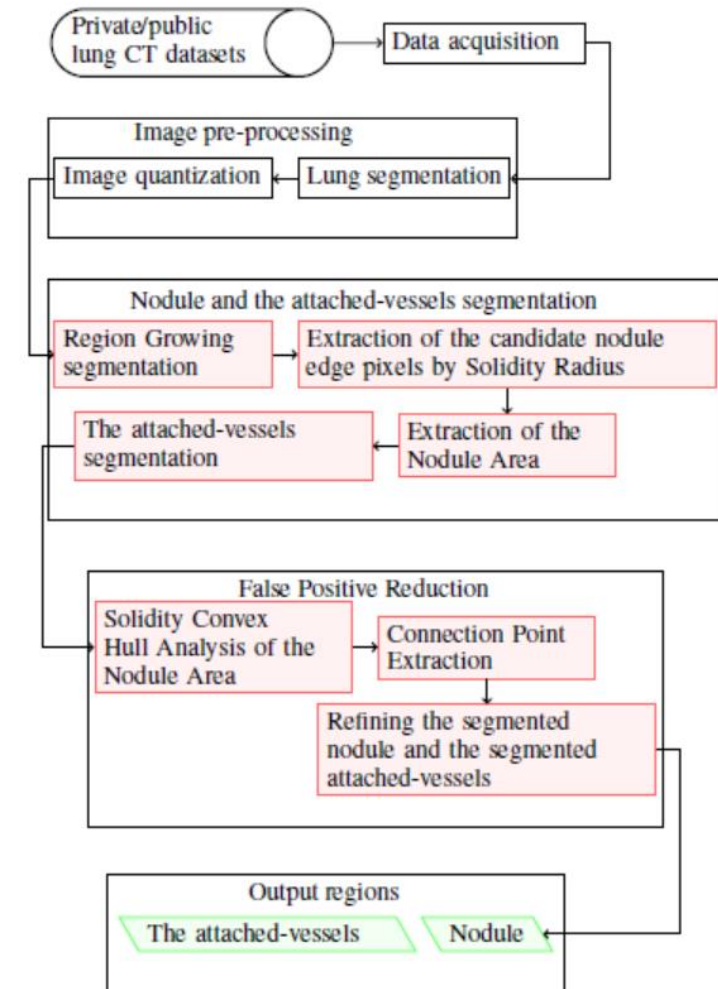
# BLIND RECONSTRUCTION OF CHANNEL CODES

- M. Teimouri and Masoud Rezaei, “Blind Classification of Space-Time Codes Using Machine Learning,” Advanced Defence Science and Technology, vol. 10, no. 1, pp. 1-10, 2019 [in Persian]. Available at [adst.ihu.ac.ir](http://adst.ihu.ac.ir)
- M. Teimouri, H. R. Kakaei Motlagh, and M. Haddadi, “Blind Recognition of BCH Product Codes,” Tabriz Journal of Electrical Engineering, vol. 47, no. 1, pp. 49-54, 2017 [in Persian]. Available at [tabrizu.ac.ir](http://tabrizu.ac.ir)
- M. Teimouri and A. Hedayat, “Parameter Estimation of Turbo Code Encoder,” Advances in Electrical Engineering, vol. 2014, p. 6, 2014. DOI: [10.1155/2014/282108](https://doi.org/10.1155/2014/282108)



# SEGMENTATION OF MEDICAL IMAGES

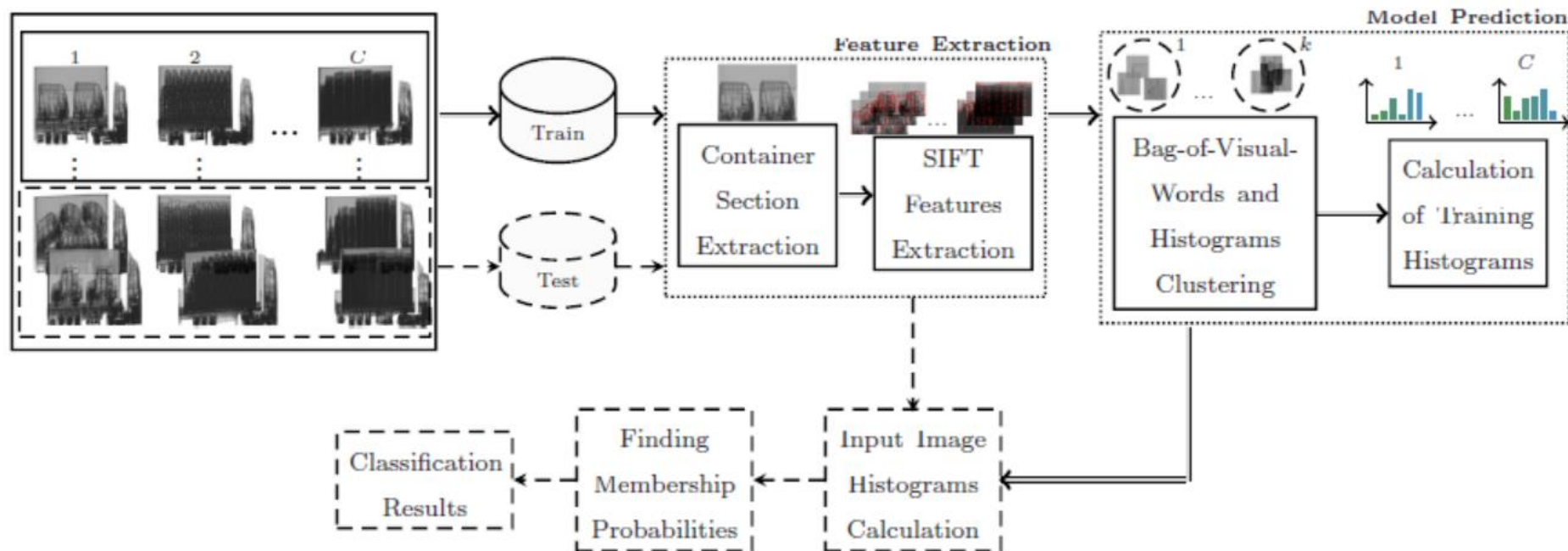
- M. Bank Tavakoli, M. Orooji, M. Teimouri, and R. Shahabifar, "Segmentation of the pulmonary nodule and the attached vessels in the CT scan of the chest using morphological features and topological skeleton of the nodule," IET Image Processing, vol. 14, no. 8, pp. 1520-1528, 2020. DOI: [10.1049/iet-ipr.2019.1054](https://doi.org/10.1049/iet-ipr.2019.1054)
- F. Riahi, H. Veisi, and M. Teimouri, "Segmentation and Detection of Breast Masses in Mammograms," in proc. 21th National CSI Computer Conference, 8-10 March 2016, Tehran, Iran, pp. 540-545 [in Persian]. Available at [CSI](https://doi.org/10.22084/CSI.2016.540-545)





# CLASSIFICATION OF X-RAY IMAGES

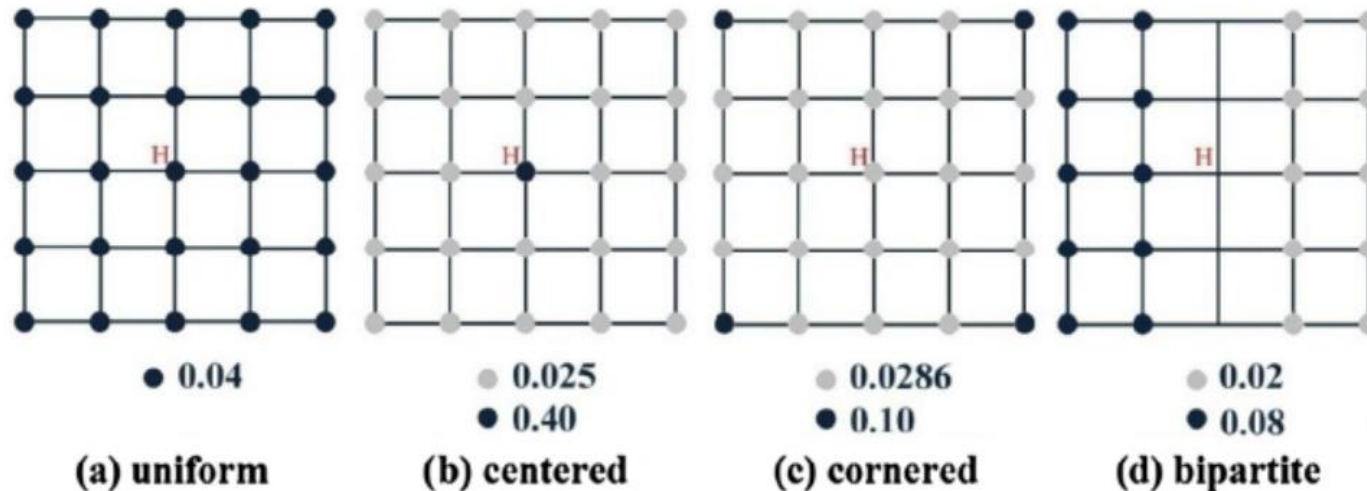
- M. Abdolshah, M. Teimouri, and R. Rahmani, "Classification of X-Ray Images of Shipping Containers," Expert Systems With Applications, vol. 77, pp. 57-65, 2017. DOI: [10.1016/j.eswa.2017.01.030](https://doi.org/10.1016/j.eswa.2017.01.030)





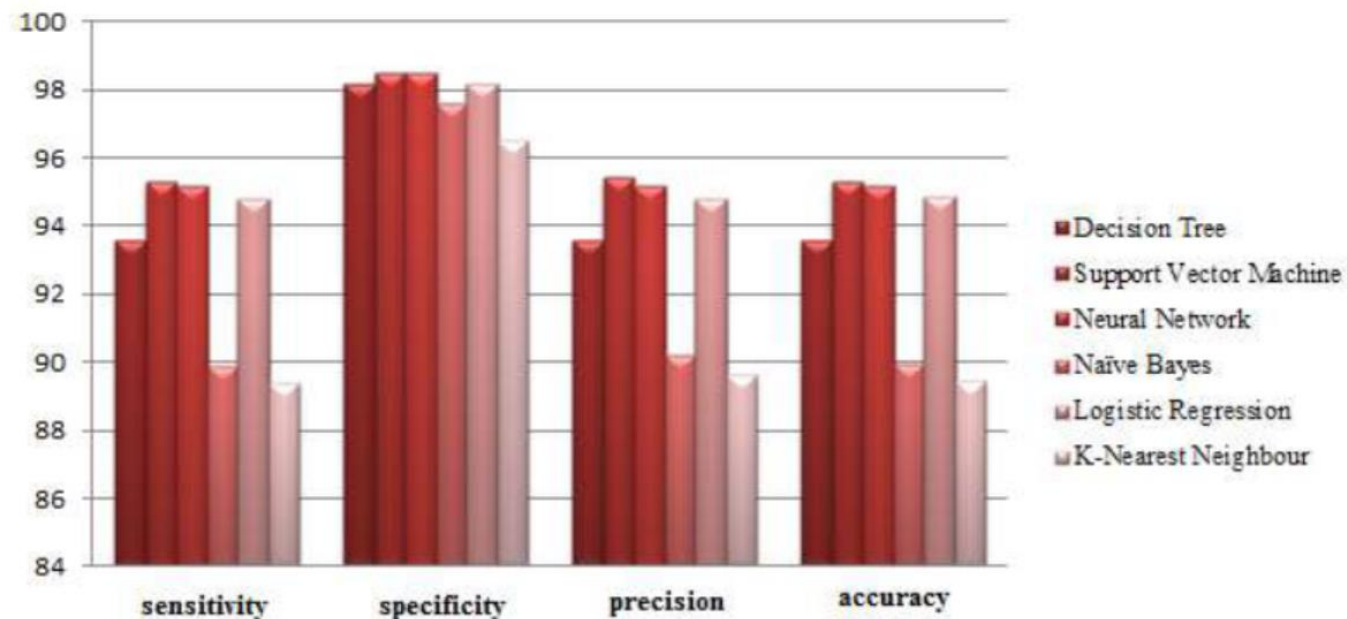
# AMBULANCE DISPATCHING BASED ON COMPLEX NETWORKS AND ARTIFICIAL INTELLIGENCE

- M. Zarkeshzadeh, Z. Heshmati-Rafsanjani, H. Zare, and M. Teimouri, "An Optimized Ambulance Dispatching Method Based on complex Networks and Artificial Intelligence," Journal of Information and Communication Technology, vol 7, no. 23, pp. 63-78, 2016 [in Persian] Available at [sid.ir](http://sid.ir)
- M. Zarkeshzadeh, H. Zare, Z. Heshmati, and M. Teimouri, "A Novel Hybrid Method for Improving Ambulance Dispatching Response Time through a Simulation Study," Simulation Modelling Practice and Theory, vol. 60, pp. 170-184, January 2016. DOI: [10.1016/j.simpat.2015.10.004](https://doi.org/10.1016/j.simpat.2015.10.004)
- M. Zarkeshzadeh, Z. Heshmati, H. Zare, and M. Teimouri, "A Hybrid Method for Reduction of Response Time in Ambulance Dispatch," in proc. 19th National CSI Computer Conference, 4-6 March 2014, Tehran, Iran [in Persian]. Available at [CSI](http://csi.ac.ir).



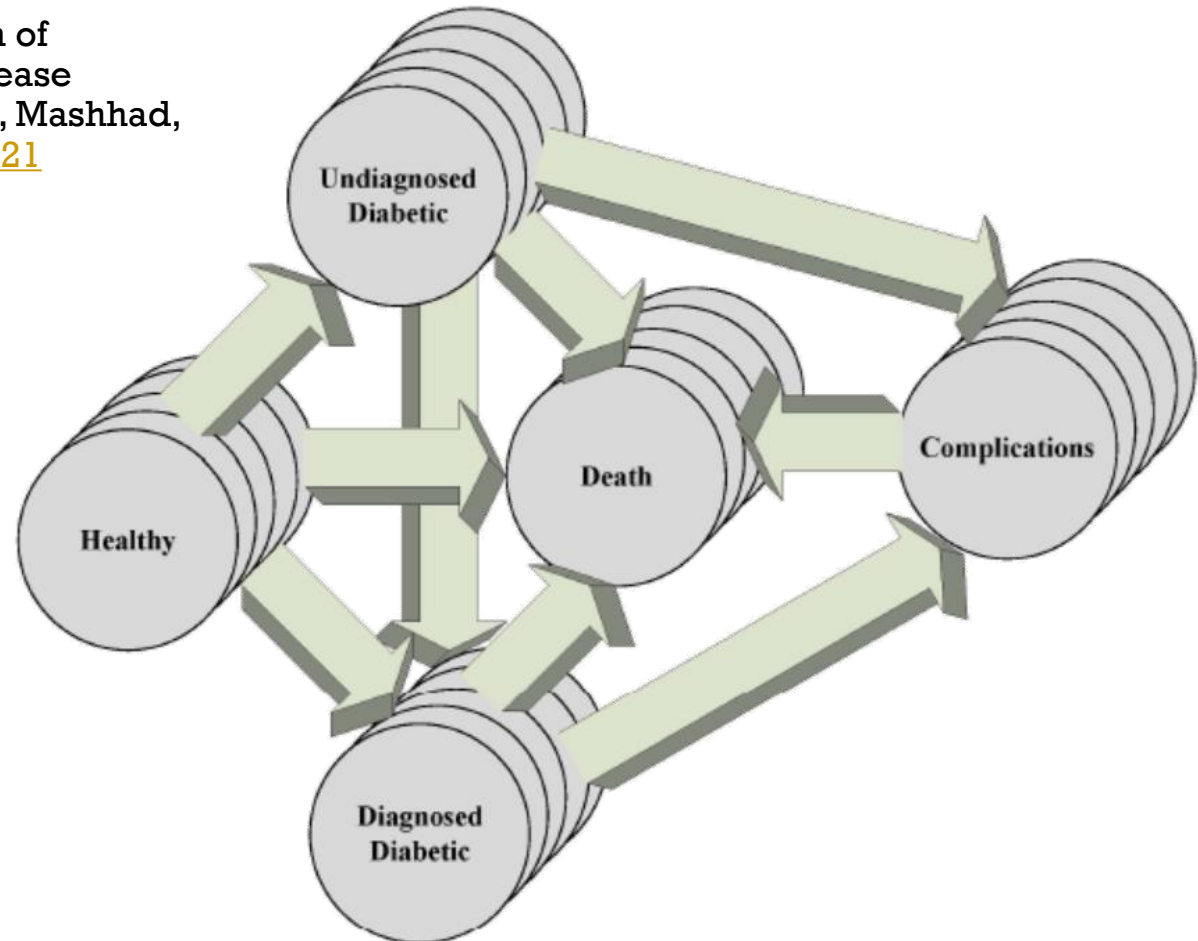
# CLASSIFICATION OF OUTPATIENT'S PRESCRIPTIONS

- M. Teimouri, F. Farzadfar, M. S. Alamdari, A. Hashemi-Meshkini, P. A. Alamdari, E. Rezaei-Darzi, M. Varmaghani, and A. Zeynalabedini, "Detecting Diseases in Medical Prescriptions Using Data Mining tools and Combining Techniques," Iranian Journal of Pharmaceutical Research, vol. 15, Special Issue of Winter 2016, pp. 113-123, 2016. Available at [sbmu.ac.ir](http://sbmu.ac.ir)
- M. S. Alamdari, M. Teimouri, F. Farzadfar, A. Hashemi-Meshkini,, "Disease Detection in Medical Prescriptions Using Data Mining Tools," in proc. ICCKE 2014, 29-30 October 2014, Mashhad, Iran, pp. 159-164. DOI: [10.1109/ICCKE.2014.6993357](https://doi.org/10.1109/ICCKE.2014.6993357)



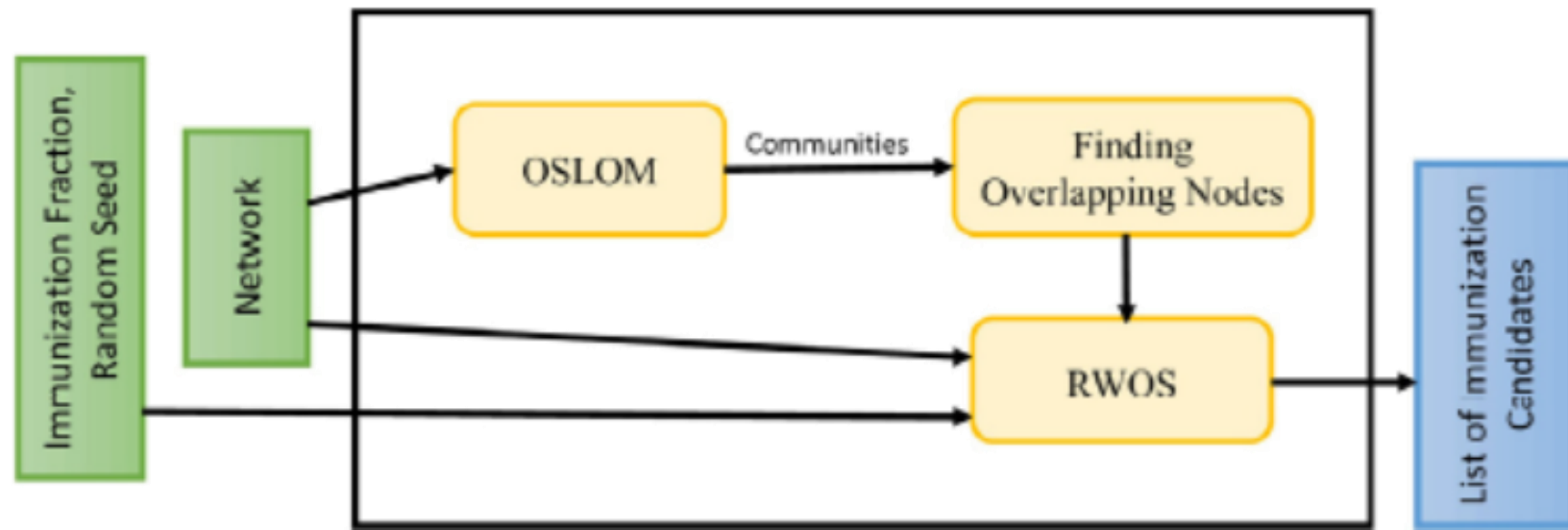
# MODELLING DIABETES BURDEN

- M. Teimouri, D. Rooein, M. Ebrahimi, “Optimization of Budgeting Type 2 Diabetes through Modeling Disease Burden,” in proc. ICCKE 2014, 29-30 October 2015, Mashhad, Iran, pp. 164-169. DOI: [10.1109/ICCKE.2015.7365821](https://doi.org/10.1109/ICCKE.2015.7365821)



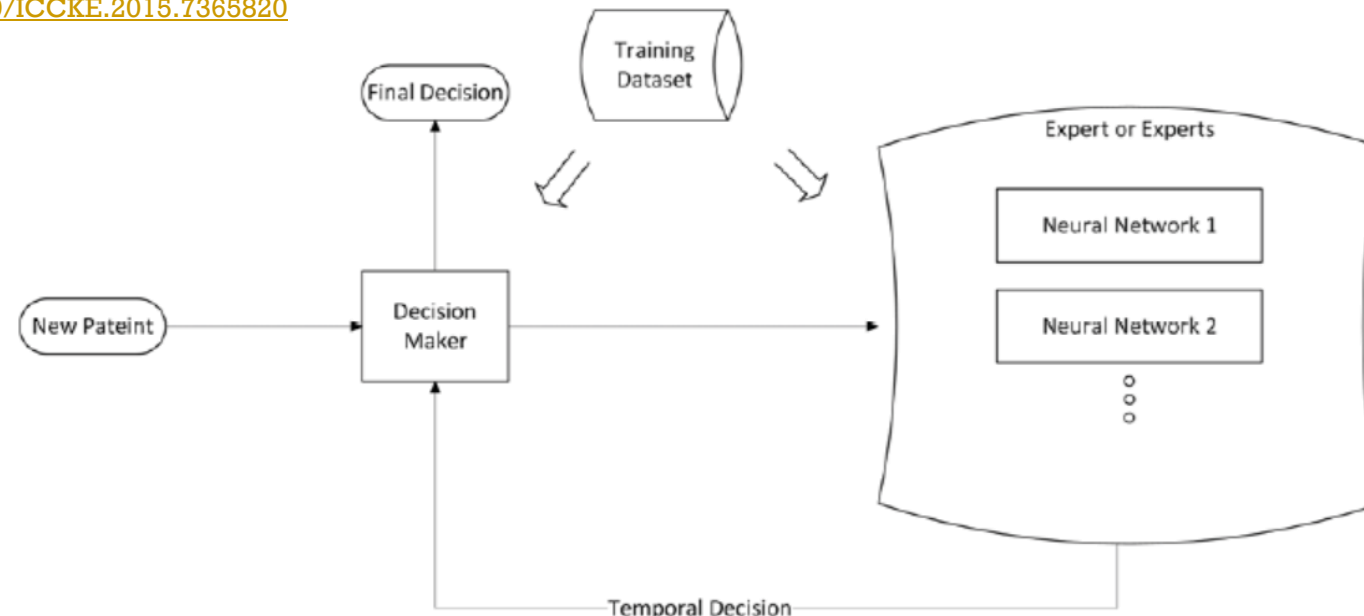
# EPIDEMICS ON NETWORKS

- F. Taghavian, M. Salehi, and M. Teimouri, “A Local Immunization Strategy for Networks with Overlapping Community Structure,” Physica A: Statistical Mechanics and its Applications, vol. 467, pp. 148-156, 2017.  
DOI: [10.1016/j.physa.2016.10.014](https://doi.org/10.1016/j.physa.2016.10.014)



# PREDICTION OF DIABETES AND HYPERTENSION RISK

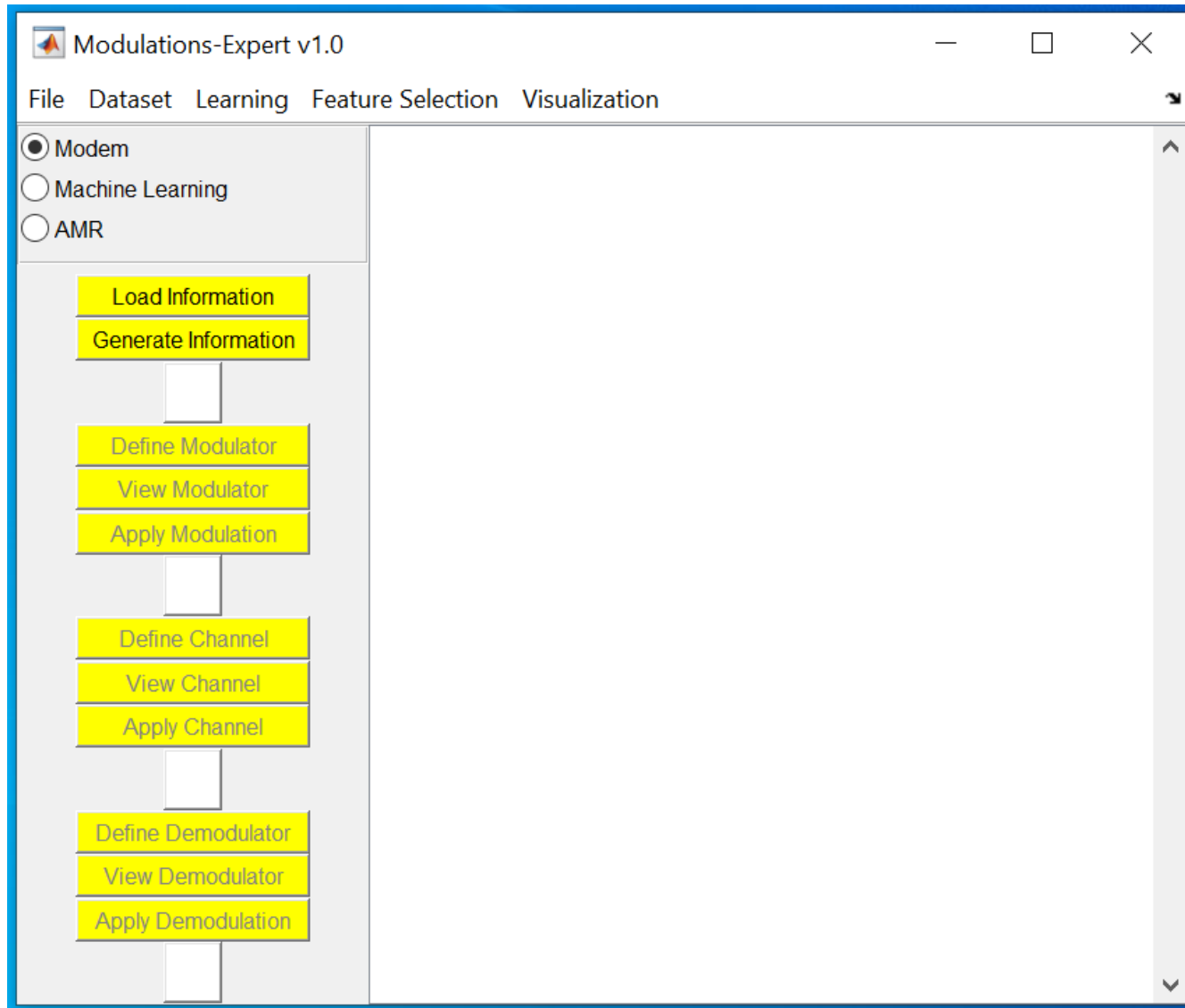
- K. Zahirnia and M. Teimouri, "Cost-Sensitive Neural Network for Optimizing Medical Expenditures of Populations," International Journal of Artificial Intelligence, vol. 16, no. 2, pp. 78-105, 2018. Available at <http://www.ceser.in>
- M. Heydari, M. Teimouri, Z. Heshmati, and S. M. Alavinia, "Comparison of various classification algorithms in the diagnosis of type 2 diabetes in Iran," International Journal of Diabetes in Developing Countries, vol 36, no. 2, pp. 167-173, June 2016. DOI: [10.1007/s13410-015-0374-4](https://doi.org/10.1007/s13410-015-0374-4).
- M. Teimouri, E. Ebrahimi, and S. M. Alavinia, "Comparison of Various Machine Learning Methods in Diagnosis of Hypertension in Diabetics with/without Consideration of Costs," Iranian Journal of Epidemiology, vol. 11, no. 4, pp. 46-54, 2016 [in Persian]. Available at [turns.ac.ir](http://turns.ac.ir)
- K. Zahirnia, M. Teimouri, R. Rahmani, A. Salag, "Diagnosis of Type 2 Diabetes Using Cost-Sensitive Learning," in proc. ICCKE 2014, 29-30 October 2015, Mashhad, Iran, pp. 158-163. DOI: [10.1109/ICCKE.2015.7365820](https://doi.org/10.1109/ICCKE.2015.7365820)



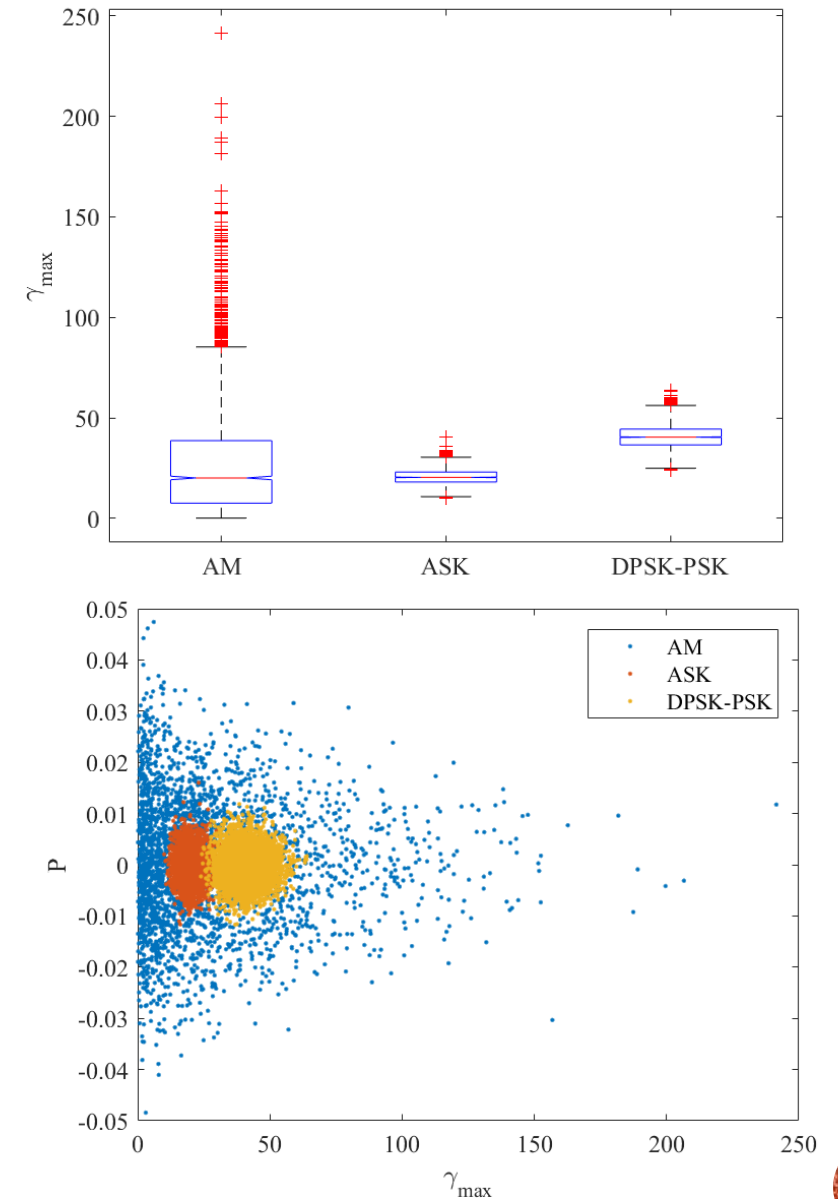
# INDUSTRIAL PROJECTS



# MODULATION RECOGNITION

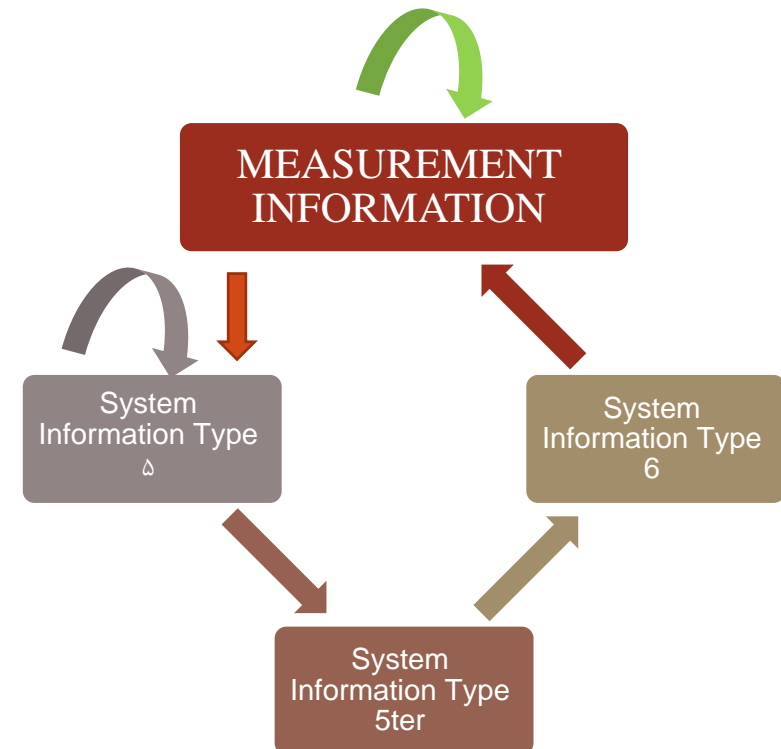
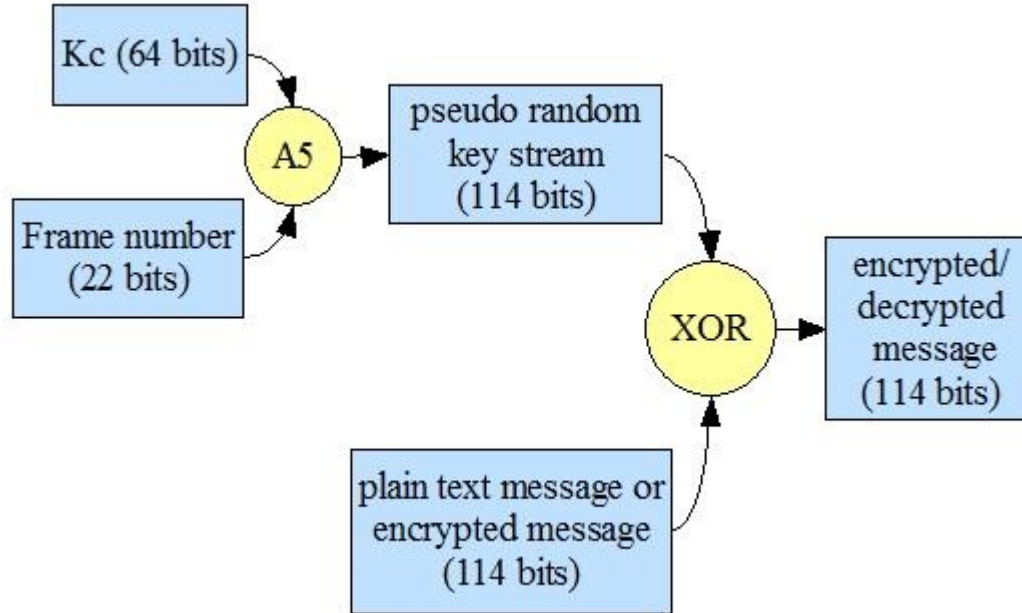


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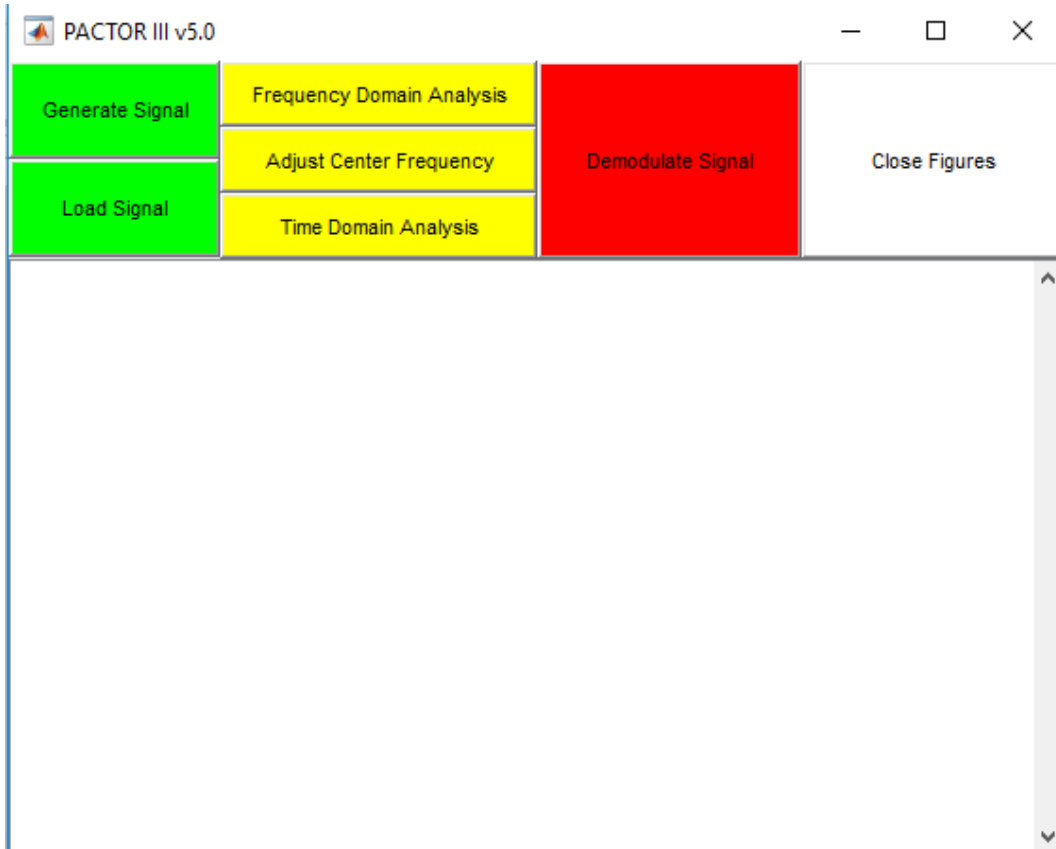


# PLAINTEXT PREDICTION IN GSM

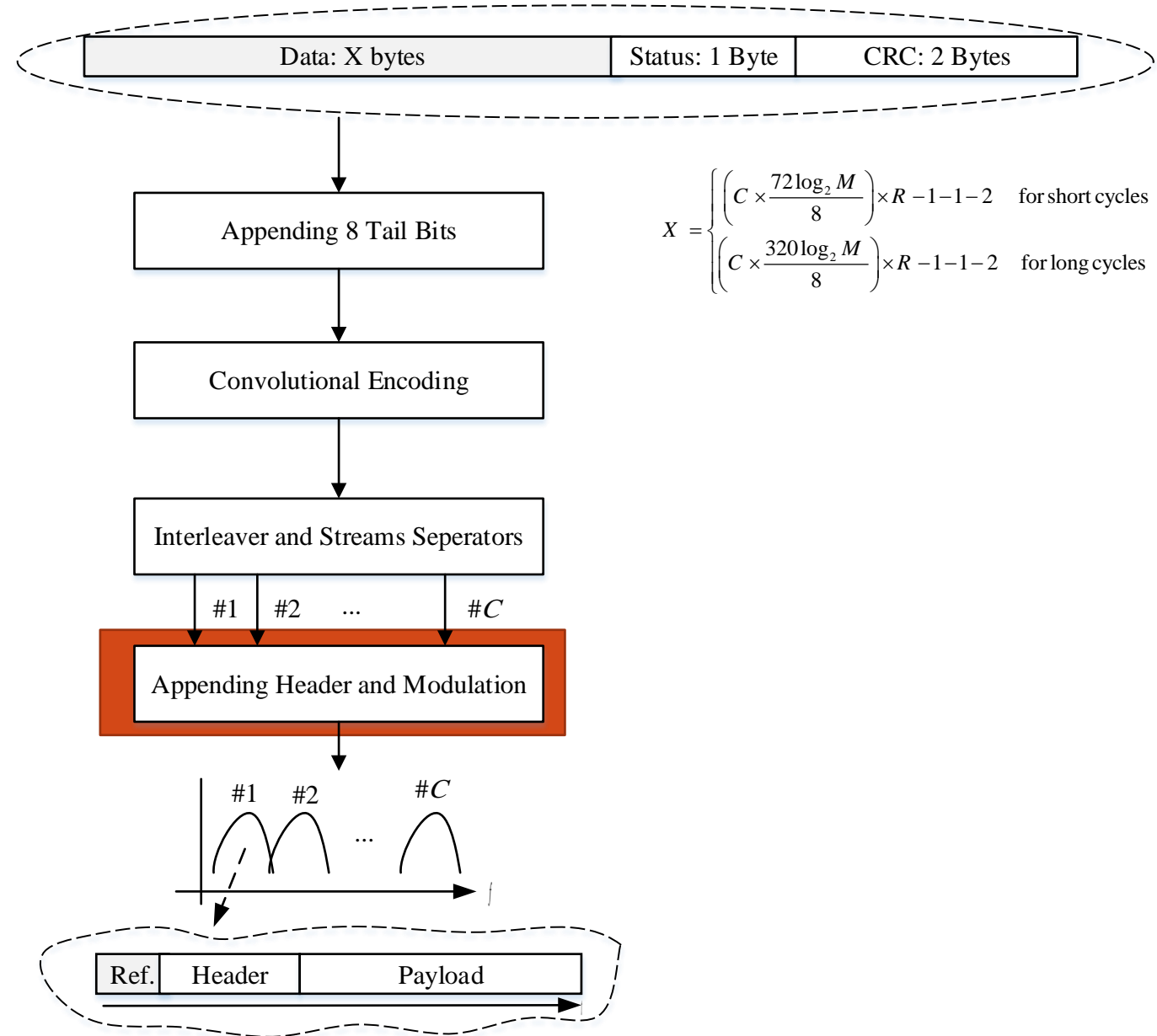




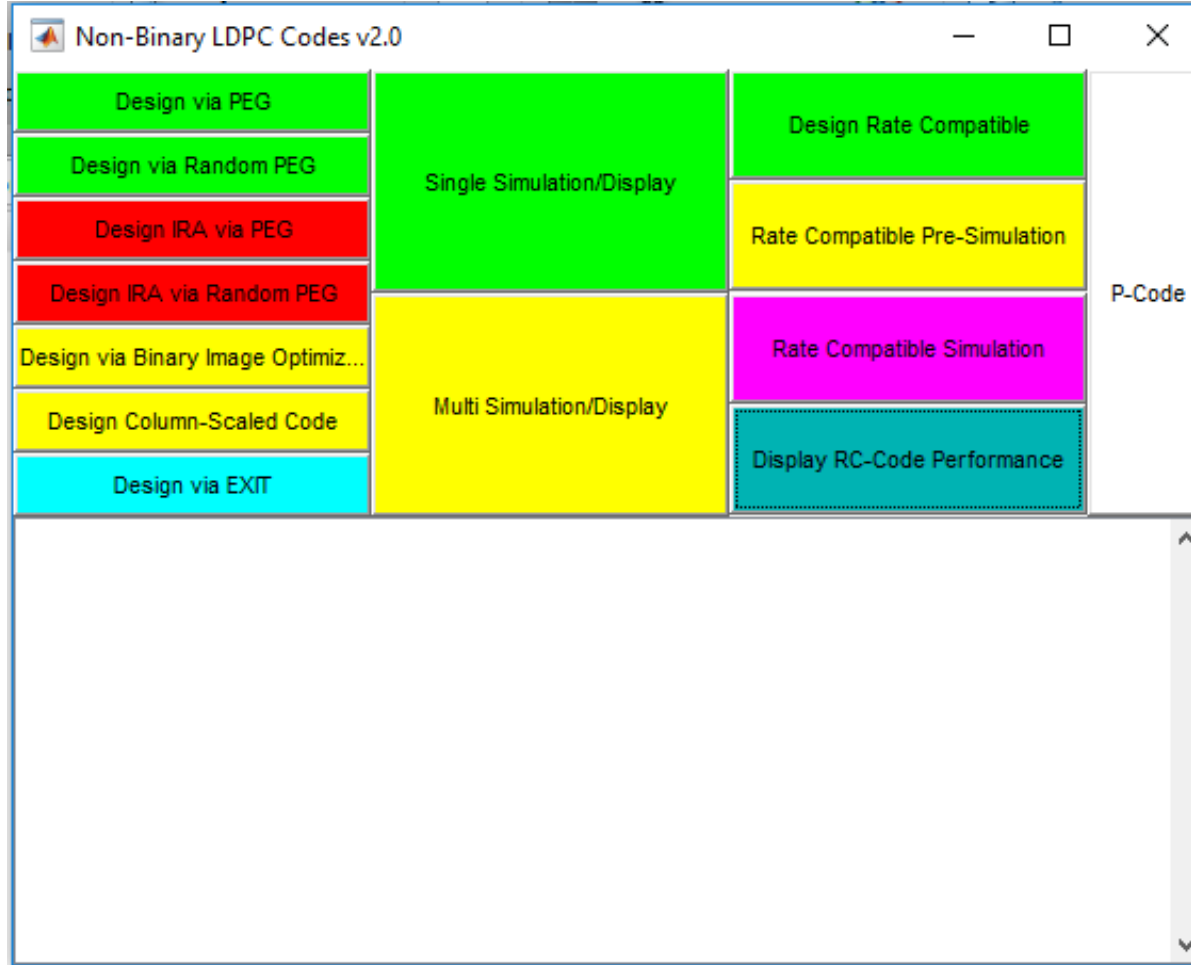
# PACTOR III RECEIVER



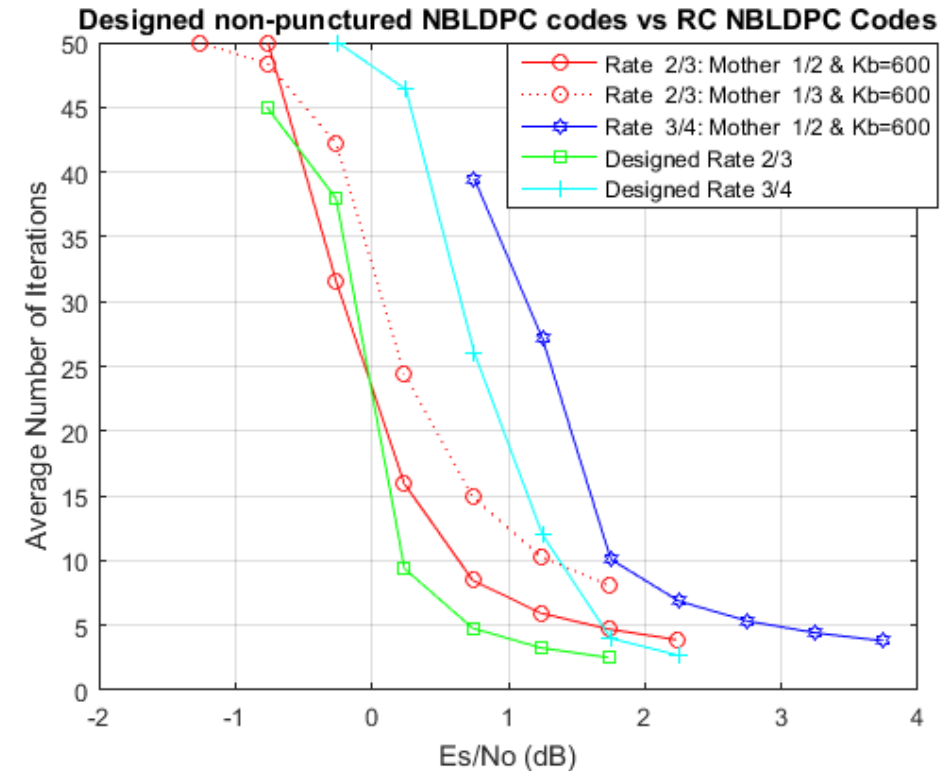
<http://itc.ut.ac.ir>



# NON-BINARY LDPC CODES FOR COMMUNICATIONS SYSTEMS



<http://itc.ut.ac.ir>



# LINK-16 DETECTOR

- M. Teimouri, "Detection of Link 16 Signal," Tabriz Journal of Electrical Engineering, vol. 46, no. 4, pp. 84-87, 2016 [in Persian]. Available at [tabrizu.ac.ir](http://tabrizu.ac.ir)

