Academic Journal of Nawroz University (AJNU), Vol.11, No.4, 2022
This is an open access article distributed under the Creative Commons Attribution License
Copyright ©2017. e-ISSN: 2520-789X
https://doi.org/10.25007/ajnu.v11n4a1481

Technical Analysis of Digital Currencies and the Most Important Indicators for Trading

Renas Rajab Asaad
Department of Computer Science, Nawroz University, Duhok, Kurdistan Region of Iraq

ABSTRACT

Technical analysis studies chart patterns, using indicators based on past price action data to predict future trends. Technical analysis involves mathematical calculations based on an asset's price or volume, with the results used to predict future prices and can indicate a market trend or warnings that the trend is about to reverse. No single indicator will detect a market reversal or confirm a market trend. The best strategy is to use a combination of indicators, or better, choose only a few of the available tools and combine them without too much chart cluttering, which might lead to more confusion than clarity. The tools are available, and traders will personalize their experience choosing the ones that better fit their trading style. No specific indicators will offer better results than others; it's mainly down to whether the trader feels more comfortable using one indicator over another. This article will cover some of the most popular and utilized crypto research and investment tools available in the crypto space. However, this is by no means an exhaustive guide of resources available. With more experience, a trader can keep learning and understand the countless possibilities of other technical analysis tools.
Keywords: Cryptocurrency, Trends, Indicator Trades, Data Analysis, Digital Marketing.

1. Introduction

Technical analysis of digital currencies is an analysis based on past digital currency prices in order to try to predict the changes that will happen to it in the near or far future. Technical analysis of digital currencies is related to the term market and price reading, through the data and data in front of you, you will be able to determine whether there is an upcoming rise in prices or a decline.[1] As a cryptocurrency trader, knowing whether the prices will rise or fall is all you want and need, because based on this you will decide whether to buy the coins at a low price and then sell them at a higher price or whatever is appropriate with the movement of the market. Technical analysis of cryptocurrencies is based on the fact that fluctuations and price changes are not something completely random, but rather follow some kind of patterns or repetitions based on supply and demand for currencies.[2] By observing and analyzing currency rates for a long time, you will be able to identify and identify the pattern early, which will make you able to predict the price movement.[3]

2. Literature Review

2.1 The Dow Theory

Going back to 1800's, at this time there was a very brilliant economist called Charles Doe. This Charles Doe founded the famous Wall Street Journal, in which he published his ideas and theories about predicting price movements. These theories included something new that Charles then called Indicators, the first of which in the world of economics was the DJT or The Dow Jones Transportation Index. The moment he published these ideas and indicators was the birth of what is now known as technical analysis of trading, and all of his contributions and theories were later collected under the title The Dow Theory. [4] This theory included some of the basics that you must know to practice technical analysis of digital currencies, the most important of which are:

A. The market reflects everything

This is the first principle of Doe's theory and technical analysis, and it states that everything can affect the prices of the assets you are trading (in our case here cryptocurrencies). It is sometimes possible for a company's stock to rise if it is expected to perform well or take on a new project, even before it actually has results on the ground. Therefore, you must include in your analysis the various factors that can affect the prices of the cryptocurrencies you are trading.[4]

B. Kinds of Trends in the Market

There are 3 types of trends in the economic and financial markets:

- Primary Trends
- Secondary Trends
- Tertiary Trends

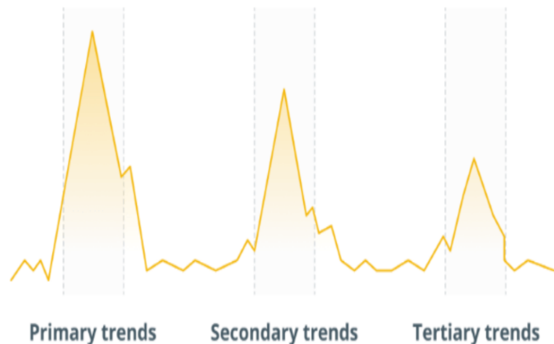

Figure 1: Market Trends

Primary Trends are major movements and changes lasting months or years, which can either be refreshing or disheartening for the market. Secondary trends are counter-trends that reverse primary trends and last for months or weeks. If the primary trend is a severe drop in prices, the secondary trends are a rise in prices or vice versa, and the aim is to create a state of balance and stability in the market. Tertiary Trends are trends that last for days, which are a loosening of the market pattern, and usually go unnoticed in the long run.[5]

C. Primary Trends Basic Stages

The primary trends consist of three stages. The first stage is accumulation: after prices fall, traders and investors accumulate assets in order to take advantage of them when their prices rise again. The second stage is Public Participation: At the beginning of the price rise, the public notices investment opportunities for profit, and thus they try to catch up with the trend and buy in the hope of selling later at higher prices. The third stage is Excess & Distribution: This is the end or near-end stage of the price hike, the professionals know that this is the biggest price of the asset and that later it will go down again, so they sell it at the highest price. Thus, this is of course in the event that the market movement is rising Bull Market.[6]

D. Trading Volume

The trading volume of an asset is a very strong indicator of its price action, and by relating the primary and secondary trends to their trading volume, and can predict whether the trend will continue. [7]

3. Materials and Methods

3.1 Market Movement: Bull Market and Bear Market

The market movement has two possibilities, either it is an upward movement and an increase in prices, or it is a movement down and prices decrease. The name for these two movements has been known, which is that the price increase movement is called the Bull Market, and the movement of declining prices is called the Bear Market. The reason behind this name is the way in which each of these two animals attacks, the bull attacks from the bottom up by raising its horns in the face of its opponent, and therefore the movement of the price rise was referred to as the bull market or as the adjective Bullish. As for the bear, because it attacks its opponent from top to bottom, it was linked to the movement of falling prices and the term Bear Market or the adjective Bearish was agreed upon. Dear reader, make sure to remember and understand these terms well, as they are frequently used in all explanations and training courses. The Bull Market is a positive sign, it is caused by a boom in the markets, and investors have believed in the value of a cryptocurrency and poured money into it. This period of the market is usually characterized by: the high prices of digital currencies, the increase in demand for them in a way that exceeds the supply, and the increased interest in them and the injection of money to them to the extent that they may be purchased at more than their value. Connected to this period is the so-called "Bull Run", a period during which investors purchase cryptocurrencies very intensively. The Bear Market, on the other hand, does not bode well. It is a sign of declining prices for the assets owned by investors and traders. The market is characterized by extreme inactivity in these periods, and there are usually devastating events that precede or contemporaneously with this stage of the market, such as: wars, epidemics, political crises, horrific events, or the like. There will also be signs that traders and investors will learn that the market will enter the bear stage, including that the trading volume will decrease and the so-called "Death Cross" will occur in trading. The most obvious manifestations of the Bear Market are falling prices, oversupply, and less investor interest in the asset.[7]

3.2 Understanding the Market: Reading Candlestick

As you know, technical analysis of cryptocurrency is based entirely on the analysis of historical data of cryptocurrency prices, and in order to do this there must be a good presentation of this data or prices. One of the most popular and most used ways to display these prices is the Japanese candlestick or the so-called candlestick.[8]

Figure 2: Candlestick

Japanese candles are a representation of the price of an asset or cryptocurrency over a period of time, which can be as short as an hour or as long as a week or a month depending on your choice.
The reason for its use and reliance on it is that it is easily able to provide us with four basic values, namely: the opening point, the highest point, the lowest point, the lowest point, and the closing point, which are called OHLC values.[9]

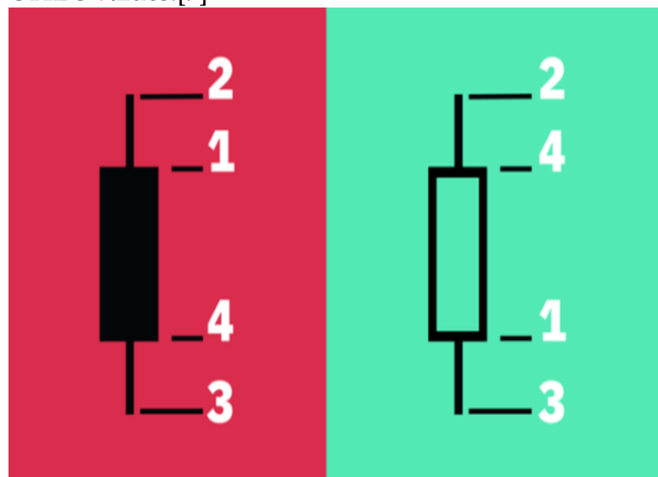

Figure 3: Japanese Candles

The image above shows the Japanese candles for two cryptocurrency values or prices, so that the green indicates the currency's increase in price during a period of time, and the red indicates the decrease in the price of that digital currency.

3.3 Analyzing the Japanese Candles:

- Is the opening point, representing the price of the asset or currency during the beginning of the particular time period represented, in the green candle it is low because the price has risen afterwards, and in the red candle it is high because the price has fallen afterwards.
- This is the highest point of the cryptocurrency price, which is the highest point of the candle in any candle state.
- It is the point that represents the lowest price of the cryptocurrency over that period of time, and it is also the lowest in any candle state whether it is green or red.
- It is the closing point for the time period, and note that in the green candle it is higher than the opening point as a result of the high prices and in the red candle it is lower than the opening point and this is due to the low prices.

This way it can be read the different state of the market in any period, and determine whether it was in the Bull Market or the Bear Market as well as the highest and lowest price reached by the asset or cryptocurrency as well. It is worth noting that the colors of the candles can be changed to your liking, but traders usually prefer them like this. The distance between the opening or starting point and the closing point is called the body, and the distance between it and the lowest or highest point is called the shadow or the wick, and the distance between the lower point and the higher point is called the range of the candle or The Range of The Candlestick. Using these Japanese candles it can apply cryptocurrency trading indicators, and with them it can predict what will happen next in cryptocurrency prices. Also, these Japanese candlesticks have many popular patterns that professionals use in order to predict market movements and price changes. In general, just looking at these candles makes us able to identify two very important things in trading and technical analysis, namely: Support and Resistance. Support and resistance are two very important principles of cryptocurrency technical analysis, and they refer to the range or line that prices cannot easily cross either up or down so that support is the demand area and resistance is the supply area.[9]

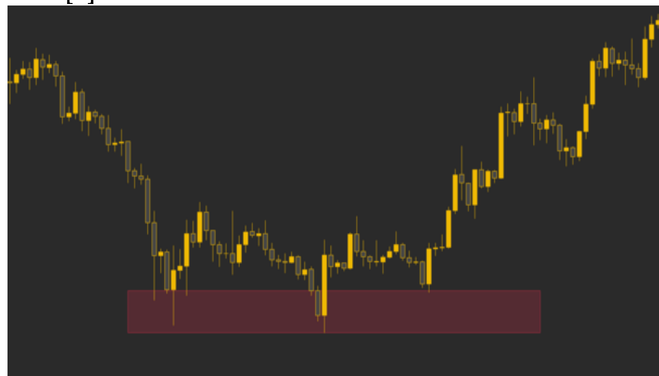

Figure 4: Japanese Candles in Lowest Point

As shown in figure, the support line or level is the imaginary line that prevents prices from falling below a certain value. You notice that whenever the price touches this line, it goes back up again. The sellers or "bears" cannot reduce prices below the level of this line. This support line can be viewed as a type of demand or represents demand, which raises prices and responds to the existing excess supply. Before moving on to the resistance line, it stress that support and resistance are not really straight lines like this, in case they apply to the real prices of cryptocurrencies they are slightly different. That's why although it simplify as two lines, it's more accurate to think of them as areas that prices can hardly cross.[9]

Figure 5: Japanese Candles in Highest Point

The resistance level or line is the opposite of the support line, as it is clear in the figure that it is the line that the prices of the assets or digital currencies do not rise from, so it is the name that resists the price rise above a certain limit. It noticed in the figure that the price failed to cross this line several times, and thus the buyers or "bulls" failed to raise the price above this limit. The resistance line as representing supply, which the higher the demand, the higher the demand, the higher the price. It is natural from time to time that it changes according to the movement of the market. If the market is in the Bull Market stage, the resistance line can become the new support line, and in the Bear Market stage, the support line can become the new resistance line.[9]

3.4. Crypto Indicators

3.4.1. Leading Indicators

Predictive indicators are indicators that help traders predict market movements and changes before they occur, and are very suitable with short-term and medium-term analysis. These indicators can determine the pattern that prices follow, especially patterns that precede a recession or depression, and therefore they are used frequently.[10]

3.4.2. lagging Indicators

Understanding indicators are a different type of cryptocurrency trading indicators that aim to look at past data and go back to the past in order to understand what is happening to it.

You may think that these indicators are useless, but they are useful in explaining past events rather than being hidden or vague.

These indicators also help to understand the current market movements in more depth and are useful in long-term analysis.[11]

3.4.3. Coincident Indicators

These indicators are one of the least used of all and the least popular especially in the cryptocurrency markets. Indicators of the present moment or chance do not look to the future like predictive indicators and do not go back to the past like indicators of understanding, but look at the present moment and try to understand what is happening. They are trying to analyze and understand the current moment and know what exactly is happening in the market to deal with. [12]

4. Important Indicators for Cryptocurrency Trading

4.1. Market Momentum

The market momentum indicator is one of the most important indicators of technical analysis of cryptocurrencies that simply measures how quickly the price of an asset or cryptocurrency is changing whether it is rising or falling. This indicator is used by traders who want a short-term analysis to achieve the largest profits, and this is because it indicates the volatility or Volatility in prices. To simplify that in the interest of the trader to complete his operations when the momentum indicator is high and exit when the indicator starts to fall. This is because a higher momentum indicator is evidence of a large price change, and thus represents an opportunity to get a big difference in the price of cryptocurrencies whether in buying or selling any big profits. The indicator is often used in technical analysis of cryptocurrencies by traders to identify opportunities whether the market is in a bull or a bear phase.[13]

Figure 6: Market Momentum

4.2. Trading Volume

Trading volume is one of the most necessary and basic indicators that traders should use, as it shows the volume of demand for trading assets or cryptocurrencies at a specific time. So it is no wonder that many specialists and economists consider trading volume to be the most important indicator in technical analysis of digital currencies at all, and herein lies the secret of the famous phrase in the trading world: "Volume Precedes Price". The presence of a large trading volume is an indication of a huge change in prices in the coming period, whether this movement is Bullish or Bearish.[14]

Figure 7: Market Volume 745

It is worth noting here that these trading indicators including the trading volume indicator - are not limited to cryptocurrencies only, but are used in the technical analysis of any other asset.

Figure 8: Market Volume VWAP

4.3. RSI Indicator

The RSI or Relative Strength Index is an indicator that relies heavily on market momentum, which shows us whether an asset or cryptocurrency is overbought or oversold. The Relative Strength Index is expressed as a line graph with a value ranging from zero to one, and it simply expresses the rate of change of prices for an asset or cryptocurrency. If its value is less than 30, this is a sign that the asset is approaching its lower value and is being sold in abundance, but if the index value exceeds 70, this indicates that the asset is close to its highest value and that it is being bought in abundance. Of course, the values of 30 and 70 should not be treated as absolutes, and in general this indicator should be dealt with carefully, because it may give you false signals in many stages of the market, especially when violent changes occur.[15]

Figure 9: RSI Indicator

4.4. Stochastic RSI Indicator

The arbitrary RSI is a derivative of the RSI Indicator is generally share one goal of knowing whether an asset or cryptocurrency is oversold or overbought. This indicator is usually faster and more sensitive to price changes, but it can also give us slightly false results or false signals. The difference between the two indicators is that this arbitrary RSI indicator, is used to obtain faster results or in short periods of time, and this makes it more capable of describing market changes so that it gives more accurate and more sensitive indicators to the trader. But despite this, and although it is used by traders in the long and short term, it has another serious drawback, which is that it emits a lot of noise or distracting signals to the trader.[16]

Figure 10: Stochastic RSI Indicator

4.5. MACD Indicator

The MACD indicator is one of the most important technical analysis indicators for cryptocurrencies ever, and by understanding only this indicator, that will be quite enough. Another indicator should be understanding called the Moving Average Indicator. The Moving Average indicator is a comprehension indicator that simplifies the movement of prices, and makes it easy to identify market trends based on historical market price data. It has many types, but two of the most popular and used are the Simple Moving Average Indicator and the Indicator Exponential Moving Average. As for this MACD indicator stands for

Moving Average Convergence Divergence, which literally means the convergence and divergence of moving rates. The translation is not expressive. This important indicator is the difference between two Asian moving averages, one of them is fast 12 and the other is slow 26 Indicators Exponential Moving Average, next to the signals line or the Signal Line, which expresses the arithmetic average of 9 closes. [17]

Figure 11: MACD Indicator

4.6. Fibonacci Retracement

The Fibonacci Retracement is one of the most important cryptocurrency trading indicators, which is frequently used by traders. The indicator is one of the most popular and most popular technical analysis indicators for cryptocurrencies, and it is based on the counterpart of the famous mathematician Leonardo Fibonacci called the Fibonacci Sequence. This Fibonacci sequence includes a number of numbers called Fibonacci numbers, and they are expressed in the form of ratios, the most important of which are: 0%, 23.6%, 38.2%, 61.8%, 78.6%, 100% and others, and these ratios are represented on the asset price chart. Or digital currencies as in the figure above. Through these ratios, the trader can identify strong entry and exit points, which helps him to manage risks and prepare stop-loss orders. It also helps traders to predict the support and resistance levels of the price of a digital asset or currency.[18]

Figure 12: Fibonacci Retracement Indicator

4.7. Bollinger Bands

The Bollinger Bands is an important indicator that measures the volatility or volatility of a market, and is often used to tell the state of an asset or cryptocurrency if it is oversold or overbought. This indicator consists of three lines or links: the first is above and is called Upper, the second is average and is called SMA, and the last is below and is called Lower. These lines or links are represented on the price chart, and by using them it is possible to identify whether there is an increase or decrease in market volatility. So that whenever the price line is approaching the upper link, the digital currencies are oversold, and whenever the price line is approaching the lower link, the digital currencies are overbought. Whenever the price line rises or falls from the SMA, this is an indication that the market will enter a very high or low stage.[19]

Figure 13: Bollinger Bands Indicator

4.8. Parabolic SAR

The Parabolic SAR is an indicator that deals with market movement and potential changes or reversals. Its name SAR is derived from Stop And Reverse, that is, the point at which the previous market movement stops and another counter movement begins. And as it is clear in the figure above, the indicator is a set of points that appear below or above the prices, so that if it is above the price, it will indicate that the market is in a downward wave, and if it is below it, it will indicate that the market is in a rising wave of prices. This indicator is used in many matters, the most important of which is risk management, especially by relying on it in the preparation of Stop-Loss Orders.[20]

Figure 14: Parabolic SAR Indicator

4.9. Ichimoku Clouds

The Ichimoku Pull Back indicator is a bit complicated, and it incorporates a lot of other indicators into its work. The Ichimoku indicator provides the trader with a lot of information such as the market momentum, support and resistance levels and the direction of market movements. This is done by calculating five different averages and placing them on the price chart, and because of their presence as shown in the image, it is called the Ichimoku Pull Indicator. When prices are above the Ichimoku cloud this indicates a bullish wave, and when prices are below the indicator this is a sign of a bearish wave.[21]

Figure 15: Ichimoku Pull Back Indicator

5. Conclusion

The above-mentioned technical tools and indicators will be useful additions to your crypto trading strategy. Many traders rely on technical analysis to make trade decisions. In fact, some believe only in technical analysis. However, combining technical and fundamental analysis is considered a more rational approach to trading. Technical analysis gives information about market trends, especially short-term trends, while fundamental analysis usually gives information that can guide your long-term investment strategies. Doing fundamental analysis will also make you aware of short-term market sentiments. A combination of technical and fundamental analysis will give better trading results.

References

[1] Abouloula, K., Habil, B. E., & Krit, S. D. (2018). Money management limits to trade by robot trader for automatic trading. International Journal of Engineering, Science and Mathematics, 7(3), 195-206.

[2] Resta, M., Pagnottoni, P., & De Giuli, M. E. (2020). Technical analysis on the bitcoin market: trading opportunities or investors' pitfall?. Risks, 8(2), 44.

[3] Neely, C. J., & Weller, P. A. (2011). Technical analysis in the foreign exchange market. Federal Reserve Bank of St. Louis Working Paper No.

[4] Shan, K. (2012). The Dow Theory. Aweshkar Research Journal, 13(1).

[5] Nishino, A. (1996). Capacitors: operating principles, current market and technical trends. Journal of power sources, 60(2), 137-147.

[6] Lanin, D. G., & Krasavin, A. V. (2020). Developmental Trends and Ways of Improving the Process of Designing Technically Complex Energy Facilities. Power Technology and Engineering, 54(3), 375-381.

[7] Islam, M. S., Wang, T., Farah, N., & Stafford, T. (2022). The spillover effect of focal firms' cybersecurity breaches on rivals and the role of the CIO: Evidence from stock trading volume. Journal of Accounting and Public Policy, 41(2), 106916.

[8] Guides, T. S. (2018). Best Candlestick PDF Guide–Banker's Favorite Fx Pattern.

[9] Mohammed, A. B. Q. Q. J. (2021). Using Japanese candles in determining market timing strategy application study of sample From companies registered in Iraq stock market. Journal of The Iraqi University, (49-2).

[10] Kim, G. Y., Paik, J. Y., Kim, Y., & Cho, E. S. (2022). Byte Frequency Based Indicators for Crypto-Ransomware Detection from Empirical Analysis. Journal of Computer Science and Technology, 37(2), 423-442.

[11] Versteeg, K., Bigelow, P., Dale, A. M., & Chaurasia, A. (2019). Utilizing construction safety leading and lagging indicators to measure project safety performance: A case study. Safety Science, 120, 411-421.

[12] Stevenson, S. L., Watermeyer, K., Caggiano, G., Fulton, E. A., Ferrier, S., & Nicholson, E. (2021). Matching biodiversity indicators to policy needs. Conservation Biology, 35(2), 522-532.

[13] Tzouvanas, P., Kizys, R., & Tsend-Ayush, B. (2020). Momentum trading in cryptocurrencies: Short-term returns and diversification benefits. Economics Letters, 191, 108728.

[14] Bianchi, D., & Dickerson, A. (2019). Trading volume in cryptocurrency markets. Available at SSRN 3239670.

[15] Guides, T. S. (2018). *Verge Trading Strategy–Amazing 2-Period RSI Day Trading System.*

[16] Guides, T. S. (2018). *How to Trade Like a Professional Oil Trader-Crude Oil Trading Tips.*

[17] Vezeris, D., Kyrgos, T., & Schinas, C. (2018). *Take profit and stop loss trading strategies comparison in combination with an MACD trading system. Journal of Risk and Financial Management, 11(3), 56.*

[18] Gurrib, I., Nourani, M., & Bhaskaran, R. K. (2022). *Energy crypto currencies and leading US energy stock prices: are Fibonacci retracements profitable?. Financial Innovation, 8(1), 1-27.*

[19] Day, M. Y., Cheng, Y., Huang, P., & Ni, Y. (2022). *The profitability of Bollinger Bands trading bitcoin futures. Applied Economics Letters, 1-7.*

[20] Abouloula, K., Habil, B. E., & Krit, S. D. (2018). *Money management limits to trade by robot trader for automatic trading. International Journal of Engineering, Science and Mathematics, 7(3), 195-206.*

[21] Zavišić, D. (2021). *Automatizirano trgovanje financijskim instrumentima temeljeno na Ichimoku Cloud metodi (Doctoral dissertation, Josip Juraj Strossmayer University of Osijek. Department of Mathematics).*

[22] Almufti, S. M., Ahmad, H. B., Marqas, R. B., & Asaad, R. R. (2021). *Grey wolf optimizer: Overview, modifications and applications. International Research Journal of Science, Technology, Education,and Management, 1(1),1-1.*

[23] Ihsan, R. R., Almufti, S. M., Ormani, B. M., Asaad, R. R., & Marqas, R. B. (2021). *A survey on Cat Swarm Optimization algorithm. Asian J. Res. Comput. Sci, 10, 22-32.*

[24] Asaad, R. R., Ahmad, H. B., & Ali, R. I. (2020). *A Review: Big Data Technologies with Hadoop Distributed Filesystem and Implementing M/R. Academic Journal of Nawroz University, 9(1), 25–33. https://doi.org/10.25007/ajnu.v9n1a530*

[25] Asaad, R. R. (2019). *Güler and Linaro et al Model in an Investigation of the Neuronal Dynamics using noise Comparative Study. Academic Journal of Nawroz University, 8(3), 10–16. https://doi.org/10.25007/ajnu.v8n3a360*

[26] Asaad, R. R., Abdurahman, S. M., & Hani, A. A. (2017). *Partial Image Encryption using RC4 Stream Cipher Approach and Embedded in an Image. Academic Journal of Nawroz University, 6(3), 40–45. https://doi.org/10.25007/ajnu.v6n3a76*

[27] Abdulfattah, G. M., Ahmad, M. N., & Asaad, R. R. (2018). *A reliable binarization method for offline signature system based on unique signer's profile. INTERNATIONAL JOURNAL OF INNOVATIVE COMPUTING INFORMATION AND CONTROL, 14(2), 573-586.*

[28] Asaad, R. R., Abdulrahman, S. M., & Hani, A. A. (2017). *Advanced Encryption Standard Enhancement with Output Feedback Block Mode Operation. Academic Journal of Nawroz University, 6(3), 1–10. https://doi.org/10.25007/ajnu.v6n3a70*

[29] Asaad, Renas Rajab. (2014). *An Investigation of the Neuronal Dynamics Under Noisy Rate Functions. Thesis (M.S.), Eastern Mediterranean University, Institute of Graduate Studies and Research, Dept. of Computer Engineering, Famagusta: North Cyprus.*

[30] Asaad, R. R., Sulaiman, Z. A., & Abdulmajeed, S. S. (2019). *Proposed System for Education Augmented Reality Self English Learning. Academic Journal of Nawroz University, 8(3), 27–32. https://doi.org/10.25007/ajnu.v8n3a366*