* Bootstrapped Random Forest (BRF)
* Bi-directional Long Short-Term Memory (Bi-LSTM)
* Wavelet-Boosted Random Forest (WBRF)
* Wavelet-Boosted Bi-LSTM (WBi-LSTM

What is spi:  
The SPI is calculated from the historical precipitation record at a weather station, where precipitation accumulation over a period of time is compared to that same period of time throughout the historical record at that location. The SPI for any precipitation accumulation value represents the probability that the location would have received at least the observed amount of precipitation over the time period. The SPI calculated in this program is based on representing the historical precipitation record with a gamma distribution. Positive SPI values represent wet conditions; the higher the SPI, the more unusually wet a period of time is. Negative SPI values represent dry conditions; the lower the SPI, the more unusually dry a period of time is.

The primary strength of the SPI is that its data can be compared between different climate regions. Since the SPI compares precipitation amounts at a weather station to that particular station’s own precipitation history, SPI data from different stations usually can be directly compared, because the SPI communicates how anomalous a precipitation amount is, not just the raw departure from normal precipitation. For regions with highly seasonal precipitation (particularly where very little to no precipitation usually falls for several months), users should be cautious when directly comparing data from these areas. The SPI generator can also be used to compute standardized indices for other variables (commonly, streamflow). Some caution should be exercised when analyzing this output, since the gamma distribution may not be the best distribution to use to model non-precipitation variables.

**Drought Indicis Package دانلود نشد** <https://climatology.ir/?p=6207>

**Abstract:**

**These days, nations are enormously suffered from weakness of forecast in climate changes.**

**Particularly in Iran with hot and arid weather in most of the areas, goverments need to depoit money to find good solution.**

**Drought phenomena as harsh catastrophe isn’t inevitable and has to be predicted in a way that authorities can make suit decisions for keep continue to live life.**

**So in this article, we proposed a study that analyze data from different meteorogical stations in northwestern of Iran and preprocess them to compute standardization precipitation index (SPI) for range of 35 years to forecast them up to 2050. Meanwhile we compare several models like SVR, EDT, LSTM, WBLSTM, RF using metrics like RMSE and Corrolation Coeficent to let Taylor Diagram annoced the winner model to be Forecaster. The results reviled that in some period there will be seviere dryness and this trend continue and flucturate with some wetness period.**

**Introduction:**

**One of the major concern in most of modern country is to reduce their damages specially the ones that their cause is natural disaster. This has massive destructive effect on countries’ economy so that said it is near 34 percent globally. The world health organization announced millions of people of the world are in shortage because of this phenomena , specially drought. Because of that, authorities are finding solutions to ease situations for people who suffered from hot condition. This solution involved at least, noticing the spot of year which climate change is hugely happened.**

**The topic of drought prediction is heard from every corner of the world. This shows the significant and the race condition. Most of these**