

**Neuro fuzzy approach for diagnosis of depression**

Submitted

To:

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By:

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**Introduction:**

Depression is classified as a mood disorder. It may be described as feelings of sadness, loss, or anger that interfere with a person’s everyday activities.

It’s also fairly common. The [Centers for Disease Control and Prevention (CDC)Trusted Source](https://www.cdc.gov/nchs/products/databriefs/db303.htm) estimates that 8.1 percent of American adults ages 20 and over had depression in any given 2-week period from 2013 to 2016.

People experience depression in different ways. It may interfere with your daily work, resulting in lost time and lower productivity. It can also influence relationships and some chronic health conditions.

Conditions that can get worse due to depression include:

* [arthritis](https://www.healthline.com/health/arthritis)
* [asthma](https://www.healthline.com/health/asthma)
* [cardiovascular disease](https://www.healthline.com/health/heart-disease)
* [cancer](https://www.healthline.com/health/cancer/managing-your-mental-health)
* [diabetes](https://www.healthline.com/health/diabetes)
* [obesity](https://www.healthline.com/health/obesity)

It’s important to realize that feeling down at times is a normal part of life. Sad and upsetting events happen to everyone. But, if you’re feeling down or hopeless on a regular basis, you could be dealing with depression.

Depression is considered a serious medical condition that can get worse without proper treatment. Those who seek treatment often see improvements in symptoms in just a few weeks.

**Depression symptoms**

Depression can be more than a constant state of sadness or feeling “blue.”

Major depression can cause a variety of symptoms. Some affect your mood, and others affect your body. Symptoms may also be ongoing, or come and go.

The symptoms of depression can be experienced differently among men, women, and children differently.

## Depression causes

There are several possible causes of depression. They can range from biological to circumstantial.

Common causes include:

* **Family history.**You’re at a higher risk for developing depression if you have a [family history](https://www.healthline.com/health/depression/genetic) of depression or another mood disorder.
* **Early childhood trauma.**Some events affect the way your body reacts to fear and stressful situations.
* **Brain structure.**There’s a greater risk for depression if the [frontal lobe of your brain](https://www.healthline.com/human-body-maps/frontal-lobe) is less active. However, scientists don’t know if this happens before or after the onset of depressive symptoms.
* **Medical conditions.**Certain conditions may put you at higher risk, such as [chronic illness](https://www.healthline.com/health/chronic-illness-self-doubts-overcome), insomnia, chronic pain, or [attention-deficit hyperactivity disorder (ADHD)](https://www.healthline.com/health/adhd/signs).
* **Drug use.**A history of drug or alcohol misuse can affect your risk.

## Treatment for depression

Living with depression can be difficult, but treatment can help improve your quality of life. Talk to your healthcare provider about possible options.

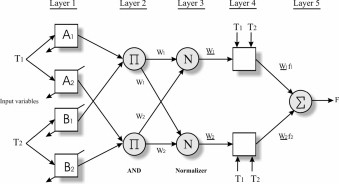
The [Healthline FindCare tool](https://www.healthline.com/find-care/specialty/mental-health?utm_source=healthline&utm_medium=in-text&utm_content=/health/depression&utm_k1=depression&utm_text=healthline_findcare_tool) can provide options in your area if you don’t already have a doctor.

You may successfully manage symptoms with one form of treatment, or you may find that a combination of treatments works best.

**Adaptive Neuro-Fuzzy Inference System**

An **adaptive neuro-fuzzy inference system** or **adaptive network-based fuzzy inference system** (**ANFIS**) is a kind of [artificial neural network](https://en.wikipedia.org/wiki/Artificial_neural_network) that is based on Takagi–Sugeno fuzzy [inference system](https://en.wikipedia.org/wiki/Inference_system). The technique was developed in the early 1990s.Neuro-fuzzy modeling refers to the way of applying various learning techniques developed in the neural network literature to fuzzy modeling or a fuzzy inference system (FIS) (Brown and Harris, 1994). Neuro-fuzzy system, which combine neural networks and fuzzy logic have recently gained a lot of interest in research and application. The neuro-fuzzy approach added the advantage of reduced training time not only due to its smaller dimensions but also because the network can be initialized with parameters relating to the problem domain . Such results emphasize the benefits of the fusion of fuzzy and neural network technologies as it facilitates an accurate initialization of the network in terms of the parameters of the fuzzy reasoning system. A specific approach in neuro-fuzzy development is the adaptive neuro-fuzzy inference system (ANFIS), which has shown significant results in modeling nonlinear functions .

ANFIS uses a feed-forward network to search for fuzzy decision rules that perform well on a given task. Using a given input–output data set, ANFIS creates a FIS whose membership function parameters are adjusted using a backpropagation algorithm alone or a combination of a backpropagation algorithm with a least squares method. This allows the fuzzy systems to learn from the data being modeled.



References:

<https://www.sciencedirect.com/science/article/pii/S2210832714000027>

https://github.com/twmeggs/anfis/tree/master/anfis