DEFINITION

# real-time communications (RTC)

**Real-time communications (RTC) is any mode of telecommunications in which all users can exchange information instantly or with negligible latency. In this context, the term 'real-time' is synonymous with 'live.'**

# Real-time communication



*Not to be confused with Real-time computing or Real-time clock.*

**Real-time communication (RTC)** is a category of software protocols and communication hardware media that gives real-time guarantees, which is necessary to support real-time guarantees of real-time computing.[1] Real-time communication protocols are dependent not only on the validity and integrity of data transferred but also the timeliness of the transfer. Real-time communication systems are generally understood as one of two types: *Hard Real-Time (HRT)* and *Soft Real-Time (SRT)*.[2] The difference between a hard and soft real-time communication system is the consequences of incorrect operation. Safety-critical systems capable of causing catastrophic consequences upon a fault, such as aircraft fly-by-wire systems, are designated as hard real-time, whereas non-critical but ideally real-time systems, such as hotel reservation systems, are designated as soft real-time.[3] The designation of a real-time communication system as hard or soft has significant influence on its design.

## Soft Real-Time Systems

Unlike hard real-time communication systems, soft real-time communication systems generally do not have the capacity to cause catastrophic harm upon a fault, which allows for non-deterministic, less rigorous network infrastructure.[6] This allows soft real-time communication systems to operate over consumer networks such as residential internet connections and cellular networks. A large amount of soft real-time systems are telecommunications products such as VOIP systems and certain video calling platforms such as Discord[7] and Google Meet.[8] Data transmitted over a soft real-time communication system is not stored in a centralized server, and peers are connected directly to one another rather than through a server, although intermediary connecting nodes between peers are allowed when a direct link cannot be established.[9]

### Examples

- WebRTC, an open-source real-time communication framework for mobile applications and web browsers, is the current most prominent implementation of real-time communication in the web-oriented telecommunications space.[10]

## Hard Real-Time Systems

Hard real-time communication systems are frequently electromechanically linked to a physical mechanism, often one that interfaces directly with people or property, which often contributes to or defines the potential danger of a fault. Due to their safety-critical nature, the communication protocols defined in a hard real-time system generally must be deterministic.[4] Hard real-time communication systems are particularly common in the transportation, industrial, and medical sectors. Common applications include control systems, automotive controllers, medical devices, and critical safety systems such as airbag firing computers.

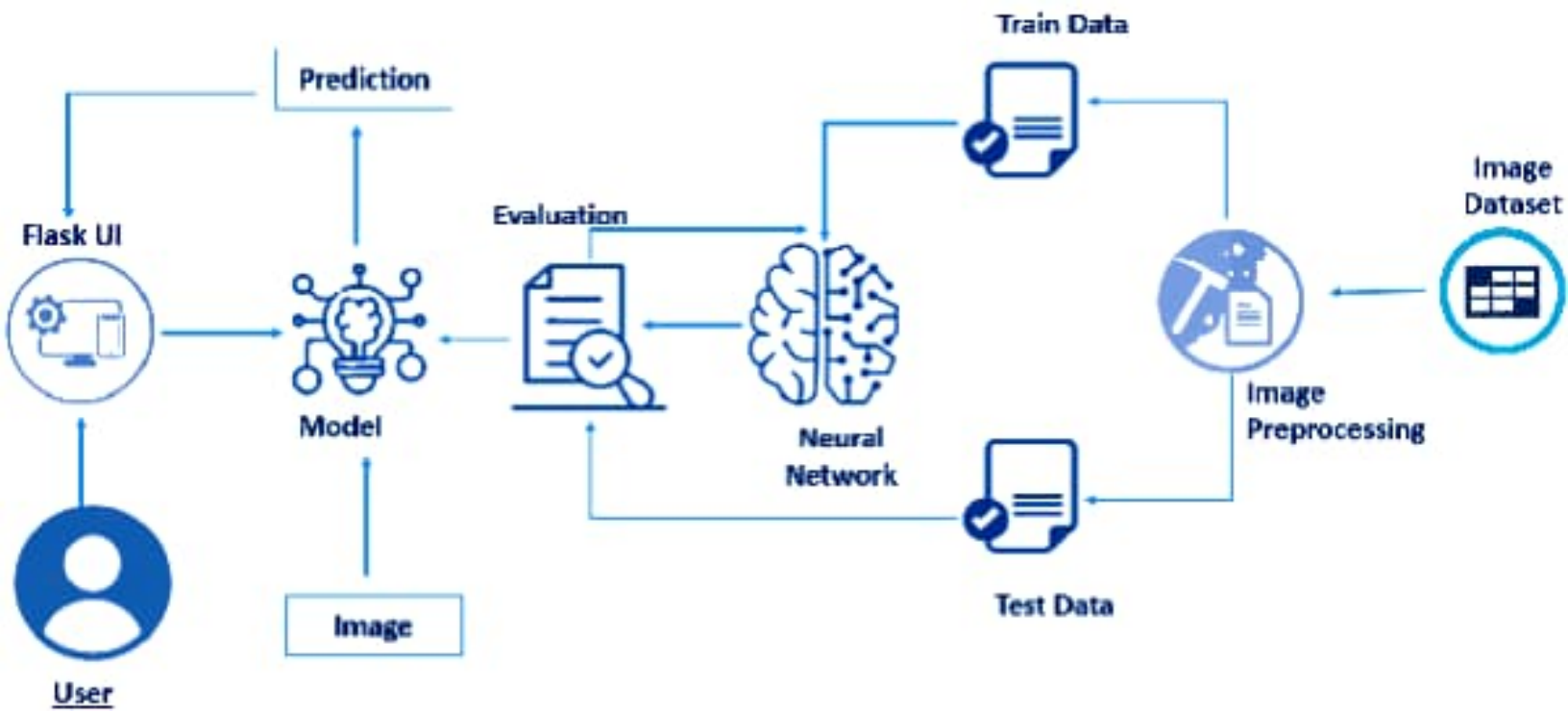
### Examples

- The spacecraft communication network SpaceWire supports real-time communication.[5]
- Time-Triggered Ethernet supports real-time synchronous communication in complex multi-hop Ethernet networks.

# PROJECT DESCRIPTION

In our society, we have people with disabilities. The technology is developing day by day but no significant developments are undertaken for the betterment of these people. Communications between deaf-mute and a normal person has always been a challenging task. It is very difficult for mute people to convey their message to normal people. Since normal people are not trained on hand sign language. In emergency times conveying their message is very difficult. The human hand has remained a popular choice to convey information in situations where other forms like speech cannot be used. Voice Conversion System with Hand Gesture Recognition and translation will be very useful to have a proper conversation between a normal person and an impaired person in any language.

The project aims to develop a system that converts the sign language into a human hearing voice in the desired language to convey a message to normal people, as well as convert speech into understandable sign language for the deaf and dumb. We are making use of a convolution neural network to create a model that is trained on different hand gestures. An app is built which uses this model. This app enables deaf and dumb people to convey their information using signs which get converted to human-understandable language and speech is given as output.


Train Data
Prediction
Image Dataset
Flask UI
Evaluation
Image Preprocessing
Model
Neural Network
Test Data
Image
User