

## THE USAGE OF IOT ON GOLANG

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This work tells about the use of the Golang language in the development of IoT applications. The language's speed, simplicity, and reliability make it a suitable choice for IoT systems. In this work, you can see the usage of the Gobot library for further work with IoT applications. Gobot, a framework for robots, drones, and IoT written in Golang, supports numerous platforms and drivers, making it a useful tool for developing IoT applications. Additionally, below will be mentioned an example of using Gobot with an Arduino board. Finally, in the article will be discussed further perspectives on using Golang in IoT devices.

Golang is an open-source programming language. This language can be used to develop IoT applications because of its speed, simplicity, and reliability. The future of the Internet of Things (IoT) is expected to grow very fast by 2030 there will be almost 7,7 billion IoT devices in China. As the number of connected devices continues to grow, there is a growing need for a programming language, like Golang, that can handle the complexities of IoT systems.

Go is a new language with built-in concurrency, which corresponds to the requirements of a huge number of connected devices in IoT networks, which allows support for a huge number of simultaneous connections. The parallelism model in Golang is created more securely and is easier to implement in a large project, which certainly has its advantages. Gobot is a framework for robots, drones, and the Internet of Things (IoT), written in the Go programming language. This framework supports 35 platforms such as ARDrone, Arduino, or Raspberry Pi, and supports 19 GPIO drivers, like servo or LEDs. Additionally, it supports five Analog I/O drivers, 24 I2C drivers, and 8 SPI drivers.

To start working with Gobot install this framework:

```
1. $ go get -d -u gobot.io/x/gobot/...
```

For a better understanding of work with Gobot, it is worth considering an example. This program connects to an Arduino and toggles an LED, every second. The line 2 creates a new Firmata adaptor, which allows communication with the Arduino board. Then on line 3, we add a connection for LED and set the PIN and Arduino board. Function “work” allows LED to blink every second. Lines 11 – 14 showed an example of creating a robot, which connected to Arduino boards via Firmata adaptor and LED. When the robot starts, it will execute the function “work”.

```

1. func main() {
2.     firmataAdaptor := firmata.NewAdaptor("/dev/ttyACM0")
3.     led := gpio.NewLedDriver(firmataAdaptor, "13")
4.
5.     work := func() {
6.         gobot.Every(1*time.Second, func() {
7.             led.Toggle()
8.         })
9.     }
10.
11.     robot := gobot.NewRobot("bot",
12.         []gobot.Connection{firmataAdaptor},
13.         []gobot.Device{led},
14.         work,
15.     )
16.
17.     robot.Start()
19. }

```

As Golang is gaining popularity among the programmers' community, it has a great opportunity for future IoT development. It can be used to develop smart homes and building applications that can control devices such as lights, thermostats, and security systems. Golang's built-in concurrency features can help manage multiple devices and sensors in real-time. It can be used in industrial IoT applications to monitor and control equipment and machinery on the factory floor. Golang's low memory usage and high performance make it well-suited for processing large amounts of data generated by industrial sensors and other devices. IoT devices can be used in healthcare to monitor patient health and track medication schedules. Golang can be used to develop applications that can process and analyze large amounts of patient data in real-time, providing healthcare professionals with up-to-date information about their patients. Additionally, IoT devices can be used in agriculture to monitor soil conditions, weather patterns, and plant health. Golang can be used to develop applications that can analyze such data and make recommendations for farmers to optimize crop yields. Golang is a compiled multi-threaded programming language that allows you to create entire systems of connected controllers, and work efficiently with databases. Thanks to its innovative and robust approach, Go has very bright prospects to lead the top IoT development technologies.

#### References:

1. Donovan, A. A. A., & Kernighan, B. W. (2015). The Go Programming Language. Addison-Wesley Professional.
2. Gobot – Golang framework — Access mode to the resource: <https://gobot.io/>