

# Alpha wave based biomimetic reactive architecture for IoRT

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**Abstract** Background / introduction Methods Results Conclusions

Cognitive computing platforms are pervasive. However in terms of desing is hard to detect. How alpha waves determine the inhibition process in the Brain? An idle common frequency between different components, which is emphasized by an equivalent alpha wave signal, which is exactly diminished when activity starts to be detected.

Devices have entered human environment, but mainly in the form of information providers, or contextual drivers. Yet sensing and action is still absence. Intelligent devices, that sense and act accordingly are still just in dream form.

Internet of Robotics Things is a field on the intersection of Internet of Things and Robotics.

Yet this coming of age of mobile devices, is not through direct immersion of robotics, it is the development of cheap and interconnected devices. Robotics will come, in hands of the internet of things.

In this work we propose a very simple and yet powerful architecture which is fully based on IoT devices.

The general idea mains three direct connections

Communications Security Power, this is perhaps the most complex and it can get enough from industry4.0

we show that a standard architecture can be achieved using low cost components.

Furthermore, the proposed architecture get inspiration from Neurosciences study by mimicking how oscilatory signals play an important role in the syn-

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chronization of different areas of the mammalian cortex. This procedure is replicated to imitate and solve, the real time synchronization of different components of a robotic application. This proposed architecture is studied by performing five traditional benchmark operations.

**Keywords** First keyword · Second keyword · More

## 1 Introduction

Unreliability of cheap sensors

Internet of Robotic Things [Simoens et al.(2018)Simoens, Dragone, and Saffiotti].

Simulating the predictability of RTOS using inspiration from alpha waves.

Multicores NVIDEA

SIM Particle

Reliability of SIM cards.

Long range wifi 802.11n

How it can be implemented without any need to add extra middleware, just by using out of the box python programs and tools. Other works like pyro

The proposed mechanism entails using USB Hubs as standard connectors. This is particularly interesting with USB 3.0 which provides more power and faster processing speed, while using a standard and cheap interconnection method.

For third world countries where cheap is necessity

The difference between robotics and automation is that the former is a general purpose automaton machine while the latter just generates repetitive tasks.

Robotics in third world countries and developing economies. Opportunity and risks.

Magnetic sensors to establish indoor localization (REF PAPER SYDNEY).

A testbed laboratory based on robotics [Hamblen and Van Bekkum(2013)].

Middleware-less solution, where the middleware is not strictly necessary.

## 2 Methods

Basic robotic technology requires to sense, to compute and to act. Any robotic solution requires different set of heterogeneous tools, which involve sensors, actuators, computes and so on. Putting all together requires middleware that allow to transmit effectively messages between different parts of the system.

The work offered by [Elkady and Sobh(2012)] provides an extensive survey of different robotic frameworks. This work describes a kiss middleware framework based on python and serial connections. On one hand, python is an extensive language which is now widespread usage on machine learning solutions. On the other hand, serial connection is an old but very robust connection interface.

The general diagram can be outlined in Figure .

## 2.1 Real Time Microcontrollers and Real time operating systems

Let's say we need 15 Hz decoding

## 2.2 Security

The system provides that the entity that achieved the captive portal initial authentication will have the tools to establish a secure trusted and confidential communication with the robotic platform.

Offer a threat model. Link with IoT Security.

## 2.3 Power

## 2.4 Benchmarks

Existing infrastructure Telemetry Streaming Initial kick off and autoconnect using a portal implemented in that and that way

Include network latency. How well and timing and for how long is able to reply back.

## 3 Results

Similar to ROSSerial a driving connection to drive out the buffering issue with serial communication between different components.

### 3.1 Heading Levels

Results for the benchmarks are shown in Figures this and that. It can be seen how the robotic operated under

- Components

- sensors

- Modules

- Software components and architecute

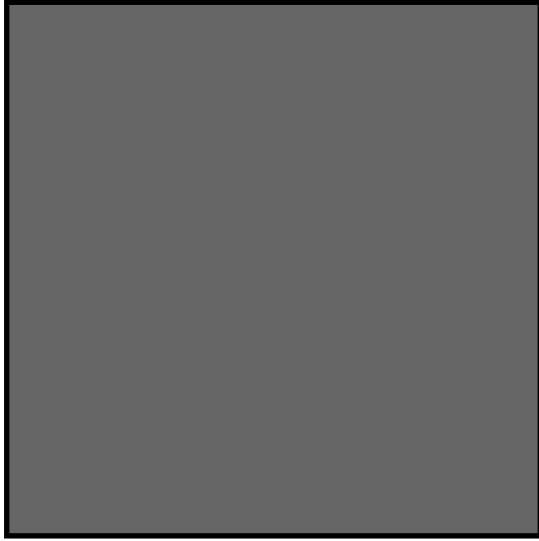
- Block diagram

- Battery Management System

## 4 Discussion

## 5 Summary

They require an extra power unit to handle power for the electronics components as well as the power electronics for motors or other devices. Without such a unit the ability of the robot to handle their own power supply is diminished.



**Fig. 1** Please write your figure caption here

**Table 1** Please write your table caption here

first	second	third
number	number	number
number	number	number

alpha dissapears when alerting by any mechanism (thinking, calculating)

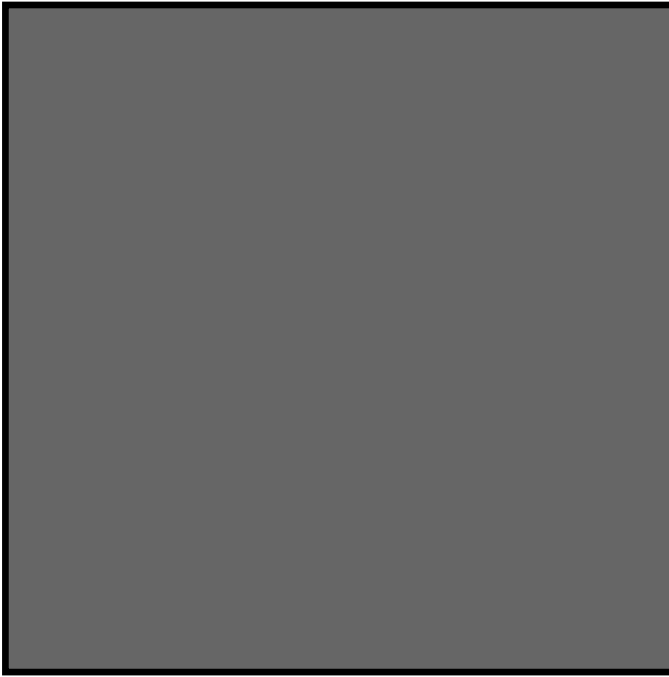
*Paragraph headings* Use paragraph headings as needed.

$$a^2 + b^2 = c^2 \quad (1)$$

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## References

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**Fig. 2** Please write your figure caption here

## References

1. Author, Article title, Journal, Volume, page numbers (year)
2. Author, Book title, page numbers. Publisher, place (year)