Automatic Human Sensor Robot

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Abstract- In this paper inflate new trends on robotics research that focus on the interaction between human and robot. This paper explore the robotics research in the field of human sensor robot that have been denominated service robotics because of their general goal closer to human needs. The aim of this paper is to provide an overview of human sensor robot.

I. INTRODUCTION

A. Robot

The appearance of the robot in our daily life is inevitable - in fact robots have been hiding in parts of washing machines, automobiles, and automatic cash dispensers for many years. Of course, such living things will not look like robots, or rather they will not take the form that most of us expect. "The robot is a tool for dramatic effects. Blues Sterling, a writer and cinema advisor for science fiction, says:" It is by chance that the word "robot" is the invention of a playwright There is none. Karelčapek 's 1920 play depicted a mechanical working class, in other words a person who was inexperienced, and thus deprived of that dignity. Chapec, a cowardly anti-fascist, was engaged in fragments of social criticism based on the ancient desires of mankind to regenerate himself: a robot that helps us and a robot that destroys us... In this way, popular culture has influenced our expectations for robots for almost 100 years. They should be formally humanoids, that looks like us, and they should think, propagate and move as we are. Our interest in these human machines has reached the world's robotics laboratory where researchers are enthusiastic about developing humanoid robots. Robots can not even learn what they can do in just two years since they were born. Stairs, ice, and sand. Looking at the actual robot, it is no wonder to find a real pet robot has a small pitfall. They are even worse than the terminator Arnold Schwarzenegger. However, what we often forget is that unlike robots (unlike humans), they do not actually require the body surrounded by themselves. Mr. Carlo Ratti, Director of Senseable City Lab at MIT, said he needed only three things: Sensor, intelligence, and actuator. In other words, they need a measuring instrument. Software that can understand and use collected information such as light, sound, heat, etc. And a device that causes a measurable physical response. From this point of view, this means that every home and every environment can be a robot. Robots can observe us at the same time with a large number of cameras, adjust the lights in the streets, and adjust the lighting in the living room according to the look. We can express smartphones as a sort of mini-robot - and we can say that we pair with us to form a robotic system. The definition of Latti's robot is certainly quite extensive, but nonetheless, certain things we think as a typical characteristic of a robot are excluded. For example, they are to teach and maneuver themselves, they should make autonomous decisions, and they should be essentially at least in part physical. However, this does not apply to all robots. Classical industrial robots can only perform actions that are programmed to run. They do not make a decision or learn by themselves. Surgical robots are benevolent - they are remotely controlled, and the same can be said for most unmanned aerial vehicles. And the Internet is full of software bots, self-learning software that can provide chatting and shopping tips with users, but it does not have a physical form. There seems to be no definition of universally accepted robot. There seems to be only one thing clear: Yes, a two-legged humanoid robot like the Atlas of Boston Dynamics was staring at snow in YouTube. But the robot is more than that. They make our physical world intelligent. Convert an object to a "smart object". They are likely to create a scenario where everything we know from the Internet leaves the screen and penetrates into three dimensional space. Looking closer, we are faced facing a machine. It helps to take care of us. Finally, we are blending with the robot ourselves. The prosthesis and the implanted chip bring the robot into us and the robot architecture and environment bring us to the robot.

According to the Encyclopedia Britannica, a robot is “any automatically operated machine that replaces human effort”. For the sake of this essay, however, we will adopt a more restrictive definition: we will call a robot a unit that has some sensors, some intelligence, and some actuators. In other words, it can read the world, process that information, and then respond in a purposeful way. By our definition, a robot could be many different and perhaps unexpected things at the same time. A thermostat is a robot. A car on driving assist is a robot. Our oven is a robot. A bracelet that measures our physical performance as we exercise is a robot. Even a bike can be a robot. That is, if it incorporates our Copenhagen Wheel, which is a wheel that can convert any bike into a hybrid vehicle, able to collect data from our daily rides (disclaimer: this is the first of many of our projects – from both MIT Senseable City Lab and Carlo Ratti Associati – that will punctuate this text as supporting examples for our arguments). And our omnipresent smartphone, too, is obviously a robot. Based on the above, our definition is very different from traditional views of what constitutes a robot, at least in artistic and literary circles – views that often involved a certain degree of anthropomorphism. As described elsewhere in this publication, the term "robot" comes from the Czech word robota ("forced labour" or "serf "), coined in 1920 by Karel Čapek in his play R.U.R. – Rossum's Universal Robots to describe the possibility – and, above all, the threat – of extremely skilful and apparently submissive automated workers. The idea of the robot was thus embedded in a framework of interaction with humanity: so deeply embedded, indeed, that the concept – from the dulcimer-playing automaton "La Joueuse de Tympanon" in the eighteenth century to Hanna-Barbera's ani-mated series The Jetsons – is almost inseparable from the idea of the android.

To be sure, the conspiracy-laden landscape of films such as Terminator (1984) and Robocop (1987) and even the more recent Automata (2014) appears much more compelling than the existence of apps that monitor our jogging habits, the temperature in our bedroom, and the gradual cooking of a stuffed turkey. Yet this does not mean that contemporary robots have no impact upon our existence. Quite the opposite. It may seem paradoxical, but the more discreet presence of robots and the more "natural" our interaction with them, the more powerful their actual influence becomes.This is the new universe in which we exist, every day. Take Nest, the thermostat which allows us to remotely control the temperature in our homes and which – if it comes into sufficiently widespread use – could have a major impact on energy consumption in buildings. The characteristics of Nest are barely notice-able, even almost humble – so radically remote from any flamboyant design gesture that it compels us to invent new ways to express it. We came to understand the challenges of such an approach a few months ago while developing our pro-ject for the renovation of the Agnelli Foundation's headquarters in the city of Turin. In the overall scheme of this project, the most notable innovation is located in the heart of the company's office rooms. Yet it is a rather intangible one. We are talking about a control system for heating, cooling, and lighting in the workplace – a system that can potentially follow people around inside the build-ing, automatically synchronising to their needs and preferences. To allow the client to appreciate the design, we resolved to craft the visualisation of an individ-ually tailored "thermal bubble". But we know that, even behind so anthropocentric a metaphor, there is a vast battalion of tiny sensor-robots.

The phenomenon that has allowed robots to become so integrated into our lives is the next logical step of the digital revolution that we have been living out over the past few decades. As virtual systems become spatialised, our cities are being transformed into the so-called "Internet of Things" (IoT). The inanimate physical environment is increasingly associated with digital layers: code married to matter, physical brick to virtual bit. The city is becoming a physical companion to Big Data, even as the urban infrastructure allows for digital information to proliferate.In fact, a full realisation of the Internet of Things could be a scenario in which technology takes the form of "smart dust" – becoming so small and diffuse as to be almost pulverised, metaphorically allow-ing technology to enmesh with air. This, in turn, would bring to fruition a concept put forward by the late Xerox-Park computer scientist Mark Weiser, whose idea of non-intrusive or "calm" technology goes by the label of "ubiquitous computing". Weiser presciently said: "Ubiquitous computing names the third wave in computing, just now beginning. First were mainframes, each shared by lots of people. Now we are in the personal computing era, person and machine staring uneasily at each other across the desktop. Next comes ubiquitous computing, or the age of calm technology, when technology recedes into the background of our lives."

In an article published in Scientific American in September 1991, Weiser wrote: "Hundreds of computers in a room could seem intimidating at first, just as hundreds of volts coursing through wires in the walls once did. But like the wires in the walls, these hundreds of computers will come to be invisible to common awareness. People will simply use them unconsciously to accomplish everyday tasks." Now, what happens if we replace the word "computers" with "robots" in that quote? The impact of ubiquitous computing or, even better, ubiquitous robotics on architecture could be immense. Throughout the twentieth century, architecture was often depicted in mechanical terms. It was Le Corbusier, almost a hundred years ago, who first referred to the modern house as a "machine for living in".10 A few decades later, Constant's New Babylon raised the bar even higher, prefiguring a city that looked like an infinitely extended settlement in the form of a huge network of raised platforms spanning the whole of Europe. In this "camp for nomads on the planetary scale",11 human lives would unfold within enclosed, reconfigurable spaces. A little later, in 1964, the avant-garde journal Archigram published a concept by Ron Herron for a moving metropolis consisting of mobile, intelligent robotic structures that could reach any place in the world. Walking cities are also modular, with the ability to connect as well as to disperse: "Walk-ing City imagines a future in which borders and boundaries are abandoned in favour of a nomadic lifestyle among groups of people worldwide."12No devotee of architectural history could fail to be fascinated by these examples. But how can we bring them into existence? Without venturing so far as to match Constant's allencompassing utopias, we can think of certain designs that are robotic interfaces themselves. This is a field that we have directly explored in our own projects.

Despite its ability to meet our needs, the idea of a robotic house still prompts some disturbing thoughts. Living within a robot-controlled house is not neces-sarily reassuring –

probably because of the robot's simultaneously mysterious and uncontrollable intel-ligence. This intelligence may be thinly concealing the looming possibility of a "betrayal" or a "hacking", irrespective of whether the agent behind such an act is robotic or human. Surely this was what another Xerox-PARC member, the composer Rich Gold, had in mind in his essay in Cybernetics and Systems, entitled "How smart does your bed have to be before you are afraid to go to sleep at night?" 14But how could our own nest manage to deceive us? We can imagine a house that plays malicious pranks on us – for example, if our flat suddenly turned into a haunted mansion – or we can consider an intelligence that gathers data about us so as to implement some subtle form of blackmail. This could take the form of an "ethical house", which would monitor your actions and could, say, result in unfavourable deals from insurance companies if you managed your own health in ways that were deemed reckless. This scenario could, in fact, become a reality in the not-too-distant future: in May 2016,15 in keeping with the industry's principle of loss prevention, the insurance and risk management company Munich Re contributed to the $20 million, GV-led funding of Helium, a startup selling smart sensors that measure domestic variables such as temperature, pressure, light, humidity, and barometric pressure.How then to deal with possible hacking and intru-sions? Hacking can be carried out anywhere and everywhere, potentially involving multiple networks in obscure locations. We all know what happens when our computer gets a virus or is hacked – and crashes. But what if our very house should crash? This possibility defies conventional strategies of re-taliation and protection. As the then US Defense Secretary Leon Panetta warned in 2012: given its current systems, the United States is vulnerable to a "cyber-Pearl Harbor"16 that could derail trains, poison water supplies, and cripple power grids.

Even assuming that we can solve the hacking issue, will we really end up with a living, tailored architec-ture that constantly shape-shifts and adapts to the needs, personalities, and desires of its inhabitants? Are we heading towards Archigram's Walking City and other utopias of the past? Are we on the verge of seeing a city made up of moving robots? This may be a realistic hypothesis from a techno-logical point of view. Yet we should perhaps begin by questioning the possibility of such a change, going back to the very nature of our buildings and cities. In fact, our metropolises, despite being the stage on which the forces of capitalism's "creative destruc-tion" continually act, are rooted in an idea of timelessness and stasis. It was Lewis Mumford, in his classic work, The City in History, who reminded us of this aspect. A city or a building also represents permanence, an antidote to the transience of life: "Mid the uneasy wanderings of Palaeolithic man, the dead were the first to have a permanent dwelling: a cavern, a mound marked by a cairn, a collective barrow. The city of the dead antedates the city of the living. In one sense, indeed, the city of the dead is the forerunner, almost the core, of every living city."18 Cities are at the same time an anchor against the transience of life and a reminder of our need to belong. In her memorable account of the Emperor Hadrian's life, Marguerite Yourcenar attributes to him the following words: "I have done much rebuilding. To reconstruct is to collaborate with time gone by, penetrating or modifying its spirit, and carrying it toward a longer future. Thus beneath the stones we find the secret of the springs."19 And again, when the old emperor reflects on the city he plans to build for Antinous, his deceased lover: "To build is to collaborate with earth, to put a human mark upon a landscape, modifying it forever there-by; the process also contributes to that slow change which makes up the history of cities."

At the beginning of the ubiquitous robotics revolution, the city is confronted with one of the key dilemmas of its multi-millennial existence – of either embracing transience and responsiveness or, instead, perpetuating a sense of timelessness as a collective attempt to counter the inevitable passing of time. Robots have the power to change our relationship with the built environment and potentially even with our bodies witness the recent diffusion of devices for the quantified self. But will they be able to do it? The interesting aspect is that we do not need to move bricks to move our cities. We can imagine that, from an architectural point of view, the robotic city of the future will not look very different from the city of today – much in the same way that the Roman urbs is not all that different from the city as we know it today. In any case, it will be able to retain its character of permanence. It will always have horizontal floors for living, vertical walls to separate spaces, and exterior enclosures to protect us from the outside – such "fundamentals", celebrated in Rem Koolhaas's 2014 Venice Biennale, are unlikely to change. The key elements of architecture will still be there, and our models of urban planning will be quite similar to what we know today. What could change is our way of experiencing the city through ubiquitous robotics. However, the impact might be increasingly forceful at the soft edge – the interface between humans and "bits and bricks". Technologies are shrinking and even vanishing from sight, gently suffusing our buildings and cities with their effects. Thanks to this discreet robotic revolution, the soft edge is acquiring a character of dynamism and responsiveness that was barely conceivable in the past. In the near future, despite being unchanged in much of its physical traits, a building might well be animated to something resembling life, becoming a direct, immediate extension of our own character and desires.[1]

II. MODEL

A. Component

i. Arduino Uno

Arduino is an open source microcontroller that can easily program, erase and erase. You can reprogram at any time.The

Arduino platform, introduced in 2005, Enable enthusiasts, students, experts to create devices in a cheap and easy way. It interacts with their environment using sensors and actuators. Based on simple microcontroller board, it is an open source computing platform used for building and programming. Electronic device. Like other microcontrollers, it also functions as a minicomputer. By taking inputs of various electronic devices and controlling output. It is also possible to send and receive information via the Internet with various help. Arduino Shield Arduino is using hardware known as Arduino Development board and software for developing code known as Arduino IDE (Integrated Development environment). It is built with 8 bit Atmel AVR microcontroller These microcontrollers manufactured by Atmel or 32-bit Atmel ARM can be easily programmed. Use C or C ++ language in Arduino IDE. Unlike other microcontroller boards in India, the Arduino board has entered the electronic market. Just a few years ago, it was limited only to small projects. People related to Electronic devices have gradually appeared and undertake Arduino's role in their projects. This development board can also be used to simply write (upload) new code to the board as follows. Uploading USB cable Arduino IDE provides a simplified and integrated platform that can be run. On a regular personal computer, users can write programs for Arduino using C or C ++.[2]

- Specifications

Microcontroller	ATmega328P – 8 bit AVR family microcontroller
Operating Voltage	5V
Recommended Input Voltage	7-12V
Input Voltage Limits	6-20V
Analog Input Pins	6 (A0 – A5)
Digital I/O Pins	14 (Out of which 6 provide PWM output)
DC Current on I/O Pins	40 mA
DC Current on 3.3V Pin	50 mA
Flash Memory	32 KB (0.5 KB is used for Bootloader)
SRAM	2 KB
EEPROM	1 KB
Frequency (Clock Speed)	16 MHz

ii. Voice Record Module - ISD1820

This module is based on ISD 1820 which is a multi-message recording / playback device. It can provide true single chip voice recording, non-volatile storage, and playback ability of 8 to 20 seconds. The sample is 3.2k, the total of the recorder is 20 seconds. The use of this module is very simple and can be controlled directly by pushbuttons on the board and microcontrollers such as Arduino, STM32, ChipKit. From these, you can easily control recording, playback, repeat and so on.

- Feature
- Push-button interface, playback can be edge or level activated
- Automatic power-dwon mode
- On-chip 8Ω speaker driver
- Signal 3V Power Supply
- Can be controlled both manually or by MCU
- Sample rate and duration changable by replacing a single resistor
- Record up to 20 seconds of audio
- Dimensions: 37 x 54 mm

iii. HC-05 - Bluetooth Module

The HC - 05 module is an easy - to - use Bluetooth SPP (serial port protocol) module designed for transparent wireless serial connection setup. The HC - 05 Bluetooth module can be used in a master or slave configuration and is the best solution for wireless communication. This serial port Bluetooth module is a fully qualified Bluetooth V 2.0 + EDR (extended data rate) 3 Mbps modulation, complete 2.4 GHz radio transceiver and baseband. It uses CSR Bluecore 04 external single chip Rluetooth system with CMOS technology and AFH (adaptive frequency hopping function).

- Specifications
- Serial Bluetooth module for Arduino and other microcontrollers

- Operating Voltage: 4V to 6V (Typically +5V)
- Operating Current: 30mA
- Range: <100m
- Works with Serial communication (USART) and TTL compatible
- Follows IEEE 802.15.1 standardized protocol
- Uses Frequency-Hopping Spread spectrum (FHSS)
- Can operate in Master, Slave or Master/Slave mode
- Can be easily interfaced with Laptop or Mobile phones with Bluetooth
- Supported baud rate: 9600,19200,38400,57600,115200,230400,460800.
- Pin Description

Pin Number	Pin Name	Description
1	Enable / Key	This pin is used to toggle between Data Mode (set low) and AT command mode (set high). By default it is in Data mode
2	Vcc	Powers the module. Connect to +5V Supply voltage
3	Ground	Ground pin of module, connect to system ground.
4	TX – Transmitter	Transmits Serial Data. Everything received via Bluetooth will be given out by this pin as serial data.
5	RX – Receiver	Receive Serial Data. Every serial data given to this pin will be broadcasted via Bluetooth
6	State	The state pin is connected to on board LED, it can be used as a feedback to check if Bluetooth is working properly.
7	LED	Indicates the status of Module • Blink once in 2 sec: Module has entered Command Mode • Repeated Blinking: Waiting for connection in Data Mode • Blink twice in 1 sec: Connection successful in Data Mode
8	Button	Used to control the Key/Enable pin to toggle between Data and command Mode

Table.5[5]

iv. HC-SR501 Human Sensor

Human sensors are motion detectors that detect heat (infrared) emitted naturally from humans and animals. When a person in the field of view of the sensor moves, the sensor detects a sudden change in infrared energy. They are commonly used in security lighting and alarm systems in indoor environments. The PIR sensor has a range of about 6 meters, depending on the conditions. The sensor adjusts to slowly changing conditions normally occurring in the environment, but shows a high output response when sudden changes occur.

- Specifications
- Operating Voltage: 5V – 20V
- Power Consumption: 65mA
- TTL output: 3.3V, 0V
- Delay time: Adjustable (.3->5min)
- Lock time: 0.2 sec
- Trigger methods: L – disable repeat trigger, H enable repeat trigger
- Sensing range: less than 120 degree, within 7 meters
- Operating Temperature: – 15 ~ +70

V. Servo Motors

High output, compact and lightweight. This servo can rotate about 180 degrees (90 degrees in each direction), it works the same way as the standard type, but it is smaller than that. You can use any servo code, hardware or library to control these servos. It comes with 3 horns (arms) and hardware.

- Specifications
- Operating voltage: 4.8 V (~5V)
- Operating speed: 0.1 s/60 degree
- Stall torque: 1.8 kgf·cm
- Dead band width: 10 µs
- Temperature range: 0 ºC – 55 ºC

v. MG90

This Servo motor is tiny and lightweight with high output power which is suitable for RC Airplane, Helicopter, Quadcopter or Robot.Also this servo has metal gears for added strength and durability.Servo can rotate approximately 180 degrees (90 in each direction), and works just like the standard kinds but smaller.

- Specifications
- Operating voltage: 4.8 V to 6V
- Operating Speed: 0.11 sec/60° (4.8V) and 0.10 sec/60°(6.0V)
- Gear Type: Metal
- Stall torque: 1.8 kgf·cm (4.8V) and 2.2 kgf·cm (6.0V)
- Dead band width: 5 µs

III. CONCLUSION

A Robot with human sensor detects heat of human, whenever a human comes in detectable range it triggers the sensor. It sends a signal to Arduino Uno, Arduino Uno then sends the stored signal to ISD 1820P, which is a record and playback module. ISD 1820P then passes that recorded signal to speakers, which produces the sound "Namaste".

IV. REFERENCE

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