

CUBITUS: MENS et MANUS

Nihit Giri¹, Abhishek Jain², Ankita Sharma³, Aryan Godara⁴,
Bhavya Jain⁵, Bhumika Gouttam⁶

¹Assistant Professor, Department of Electrical Engineering, SKIT, Jaipur
^{2,3,4,5,6}IV year, B.Tech, Department of Electrical Engineering, SKIT, Jaipur

ABSTRACT: *From first dawn of literacy to frontiers of enlightenment, paper media both printed & scripted has had the endurance to outlive centuries. Whether paper based academic exams be objective or subjective, they preserve fragmented psychological signatures of examinee's layered cognitive trajectories. 2012 evidenced the broadest exclusive variation in generic instruction and scholarship since John Gutenberg's printing press. Being educated & assessed online naturalized ever since. However,*

1. INTRODUCTION

Paper based documentation continues being regarded more advantageous, generally, than a digitally equivalent version, especially in cases that call-in to ascertain legality. Comprehensive literature review firmly signifies a major requirement for a portable means that may flexibly evaluate a wide variety of format-independent paper based responses. Aided computationally, the appliance shall prospectively fulfil a demand for computed stats that display the frequencies of every response, despite dependence on paper as a communicative medium. The foremost objective is to validate testees' responses & to compute their respective scores to charts true standing of a tested person's skill set. Cubitus is a quasi-automatized electro-mechanical apparatus purposed to evaluate dozens of responses sheets comprising responders' reply to a predefined set of objective questions. Primarily designed to grade students' objective tests, the machine may alternately be deployed to assess paper based feedback forms, questionnaires, survey preforms, staff attendance, in a broad diversity of engaging scenarios such as workshops, meetings, seminars, and conferencing, besides

over a billion global candidates continue being tested on paper. Task, that an efficiently programmed device accomplishes in a tea sip still requires intense hours, even days. Cubitus is a grader - it validates testees' responses. And so a statistician - it computes scores & charts true standing of a tested person's skill-set. The electromechanical machine with auto-calibrates its haste with patience and can yield insightful data of over 200 educatees every hour.

academic examinations. Infrared Wave-couplers distinguish answers using a color-distinction and digital sample-accumulator algorithm embedded and executed on a computer-programmed electronic controller, which serially produces instantaneous binary datasets that are directly acquired via desktop or mobile computing device, to ultimately generate statistical insights that are pointed-out using candid info-graphics. From Latin, Cubitus and Mens et Manus, translate to Hinge, and Mind & Hands, respectively. The device is purposively titled Cubitus to convey users an identically engineered analogy of man's mind and hands that typically coordinate analogous to a hinge together. Other than education, the equipment may be industrially incorporated in retail, banking, manufacturing, and select service sectors.

- (1) Compilation of papers prior to feeding collectively into the processing equipment
- (2) Sensory diagnosis of individual responses
- (3) Logic based Boolean computation of data

- (4) Arithmetic manipulation and signal conditioning, and data-transformation
- (5) Acquisition of digital data by desktop / mobile device(s)
- (6) Statistical computation of imported datasets
- (7) Clear info-graphic communication

2. TECHNOLOGY

An infrared sensor is an electronic instrument that is used to sense certain characteristics of its surroundings. It does this by detecting infrared radiation. Infrared sensors are also capable of measuring the heat being emitted by an object and detecting motion. An Infrared light emitting diode (IR LED) is a special purpose LED emitting infrared rays ranging 700 nm to 1 mm wavelength. Different IR LEDs may produce infrared light of differing wavelengths, just like different LEDs produce light of different colors. IR LEDs are usually made of gallium arsenide or aluminum gallium arsenide. In complement with IR receivers, these are commonly used as sensors. The LM358 IC works at low power and easy to use dual channel op-amp IC. It is designed and introduced by national semiconductor originally. It consists of two internally frequency compensated, high gain, and independent op-amps. This IC is designed for specially to operate from a single power supply over a wide range of voltages. The LM358 IC (A comparator/Op-Amp) is used for comparing the sensor, reference voltages. LM358 IC is available in a chip-sized package, and applications of this op amp include conventional op-amp circuits. It can handle 3-32V DC supply & source up to 20mA per channel.

LCD is used to get the display of any input given after execution of the sketch (program). In the sketch, various commands are used for various purposes

like clearing the screen of LCD with some time delay, displaying the characters or numbers, setting the cursor to a proper position in proper time etc. We have used the LCD for the display of "Question no." in first row of LCD and the correct option inserted by the faculty in the second row and finally displaying the score of a student. Motors are used for the various automation processes thus, motor controller is used. A motor controller allows using low-voltage signals from your computer to send higher-voltage pulses to the motor. The L298N is an integrated monolithic circuit in a 15-lead Multiwatt packages. It is a high voltage, high current dual full-bridge driver designed to accept standard TTL logic level and drive inductive loads such as relays, solenoids, DC and stepping motors. Two enable inputs are provided to enable or disable the device independently of the input signals. The emitters of the lower transistors of each bridge are connected together and the corresponding external terminal can be used for the connection of an external sensing resistor. An additional supply input is provided so that the Logic works at a low voltage. For simulation, an integrated development environment (IDE) is a software suite that consolidates basic tools required to write and test software. Developers use numerous tools throughout software code creation, building and testing. Development tools often include text editors, code libraries, compilers and test platforms. Without an IDE, a developer must select, deploy, integrate and manage all of these tools separately. An IDE brings many of those development-related tools together as a single framework, application or service. The integrated toolset is designed to simplify software development and can identify and minimize coding mistakes and types.

3. BLOCK DIAGRAM

The Cubitus has simplified way of checking and analyzing of student's objective test answer sheet using IR Sensor, Arduino Uno. Cubitus using Arduino is a very useful

project for analyzing of testees' response. With the technological advancements Cubitus will surely be have an efficiency of 95-98%. Figure 1 shows the basic block diagram of Cubitus.

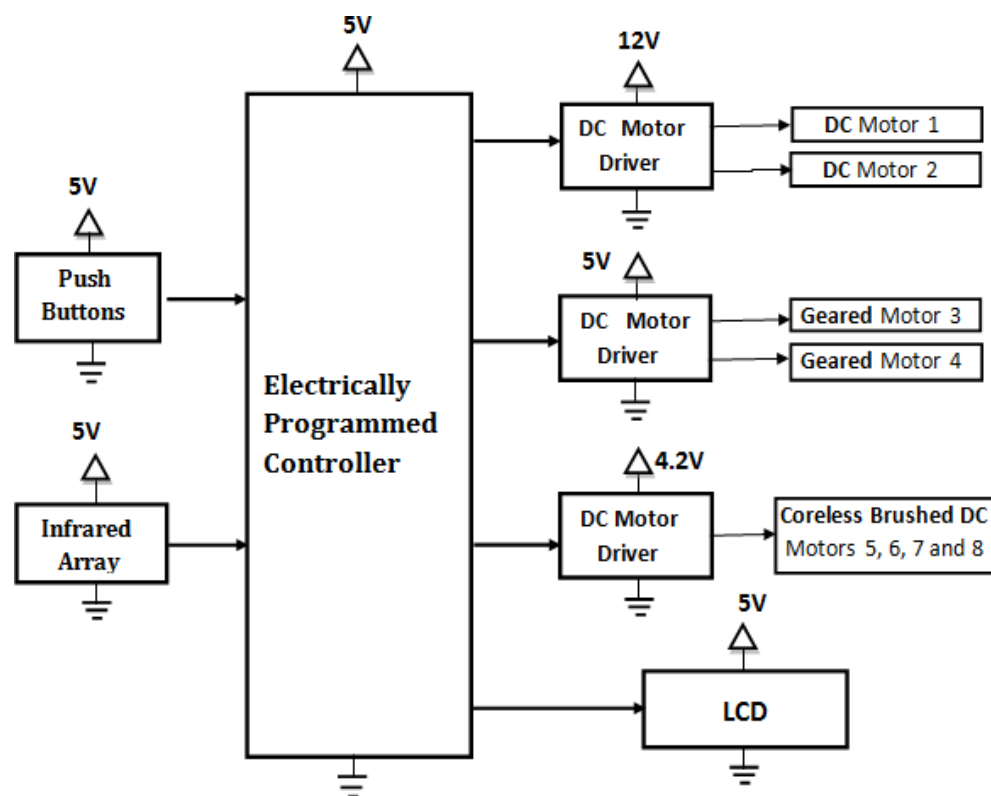
Fig.1. Block Diagram of Cubitus

In the above shown block diagram, we are having Infrared Array, which is used to collect the responses from the pencil marked answer sheet. LCD is the liquid crystal display, which is used for the inputting of answer and to collect marks of individual student.

For the automation process motor are provided so that all the internal function like motion of IR Sensor Array, upward motion of paper along with the snatching paper could be done automatically. When the IR sensor detects any color change on paper, the output of the sensor is high. The Arduino detects this

Electrically Programmed Controller is used for the software storing purpose. Here program can be store so that for long term, it can be safe and can use for the whole of Cubitus. Specifically, program like operation of motor and comparison of matrices.

For automation purpose, different motors are used like coreless motors for the up liftment of paper. Motors they are specifically used as per requirement like coreless motor is used to lift light weight things and B.O. motor is used to lift comparatively heavyweight.



4. FUTURE SCOPE

The project has great scope of future enhancement and implementation with different modifications. With some modifications, it could be used for several different purposes in future. It will reduce manual work because of the automation process and will improve the accuracy for various paper-based work. More data can be stored precisely for the future aspects as compare with the human memory life and is user friendly, which is its biggest advantage. It can be used with less running cost and have high work range in paper work based fields where objective responses are required.

5. CONCLUSION

By implementing this project we can validate testees' responses. It computes scores & charts true standing of a tested person's skill-set. The electromechanical machine with auto-calibrates its haste with patience and can yield insightful data of over 200 educatees every hour.

Infrared Wave-couplers distinguish answers using a color-distinction and digital sample-accumulator algorithm embedded and executed on a computer-programmed electronic controller, which serially produces instantaneous binary datasets that are directly acquired via desktop or mobile computing device, to ultimately generate statistical insights that are pointed-out using candid info-graphics.

6. REFERENCE

- [1] <https://www.elprocus.com/infrared-ir-sensor-circuit-and-working/>
- [2] <https://elonics.in/breadboard-projects/infrared-ir-proximity-obstacles-sensors-using-lm-358>
- [3] <https://rootsaid.com/line-follower-robot-using-arduino/>
- [4] www.pcbway.com
- [5] www.oddwires.com
- [6] www.modtronics.com
- [7] <https://www.popularmechanics.com/home/tools/a8109/motor/>