Application of AI In Process of Crew Training

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Abstract- **This paper considers the issues of managing the process of integrated training of orbital space station crews in the context of conversion to advanced digital smart technologies, computer-assisted training and artificial intelligence. This approach is predicated on the utilization of machine-controlled info systems that support the look and management of crew coaching on special-purpose simulators mistreatment a man-made intelligence technology. The process of the crew training includes planning, activity arrangement and performance control. In order to achieve the goals of crew training, it is necessary to optimize the use of appropriate resources. The concept of paper demonstrates the structure of a training session with the use of full task simulators.**

Keywords- Artificial intelligence, cosmonaut training, automatic information system, information support.

I. INTRODUCTION

The paper considers the problems of managing the method of integrated coaching of orbital satellite crews within the context of conversion to advanced digital good technologies, computer-assisted coaching and AI.[1] The projected approach relies on the employment of machine-driven data systems to support the design and management of crew coaching on integrated and special-purpose simulators victimization a man-made intelligence technology. The application of advanced digital, good technologies, robotic systems, new materials and style techniques, creation of enormous processing systems, computer-aided learning and AI are relevant for numerous branches of science and technology, as well as manned area programs. Some technology ideas and pilot systems supported the AI (3-D pc vision, machine-driven systems for coming up with and evaluating the activities of cosmonauts, inquiry and communications system) were developed within the business over many decades.[2] Astronaut coaching is one in all the foremost vital problems with the manned flights program. Its ending may be a comprehensive crew coaching, aimed toward forming necessary skilled qualifications of crew members for performing arts swamp plant operations in accordance with the objectives of this sort of coaching. The coaching of the tobacco mosaic virus crews is distributed on integrated and special-purpose simulators of the artificial satellite. Constant crew coaching technique was with success accustomed train cosmonauts on the program, once associate degree orbital piloted complicated comprised one thickly settled module with a restricted variety of aboard systems. The appliance of advanced digital, good technologies, artificial intelligence systems,

new materials and style techniques, creation of enormous processing system, pc assisted learning and AI are relevant for numerous branches of science and technology ideas and pilot systems supported the AI were developed within the business over many decades.

II. AIMS AND OBJECTIVE

a)   Aim

The aim of the creating this paper is to resolve the issues in crew coaching through the employment of AI systems.

b)   Objective

Improves quality of crew training:-

Crew coaching invests heavily in safety coaching programs and regularly benchmarks its safety and operational performance. Improve in correct teaching were among systematic decreases in stereotypy.

Helps in reduction of instructors:-

In the method of crew coaching reduces the instructors labour contribution in coming up with.

III. LITERATURE SURVEY

Paper 1: Theoretical foundations of automated control.

Feedback management is central to managing knowledge processing system| and data networks. Management theory provides a scientific approach to coming up with feedback loops that square measure stable in this they avoid wild oscillations, correct in this they come through objectives like target response times for service level management.[4] This paper provides AN introduction to manage theory for computing practitioners with a stress on applications

within the areas of info systems, time period systems, virtualized servers, and power management.

Paper 2: Expose: Anthology for data mining experiments.

The paper shows historical aspects of the applying of computer-based data systems, providing the method of astronaut coaching for an area flight at astronaut coaching Center. These systems include: systems guaranteeing the operation of simulation complexes for astronaut coaching, computer-assisted instruction systems, databases for storing the results of astronaut choice and coaching, information-management systems of astronaut coaching, astronaut coaching designing systems, knowledge retrieval systems, multimedia system complexes, etc.

Paper 3: Information Technologies of Training Cosmonauts for a Space Flight.

Possible psychological complications of a protracted house flight on the far side the world low orbit are underneath discussion since such missions were initial projected. [5]Those complications are associated with the confined surroundings of a artificial satellite throughout the flight and habitats on the moon or Mars surface, crewmembers personalities, cultural and social variations, and work-related stressors.

IV. EXISTING SYSTEM

In manned flights program, astronaut coaching is one among the foremost vital problems. Its last could be a comprehensive crew coaching, aimed toward forming necessary skilled qualifications of crew members for activity operations in accordance with the objectives of this kind of coaching. The great crew coaching because of the distinction in technological options of the coaching process.[2] This coaching is intended to reduce the worry level of the crew members. Disadvantage of Existing system is comprehensive coaching of orbital space crew, lack of time for decision making and comprehensive coaching of space vehicle crew.

V. COMPARATIVE STUDY

Table 1: Comparative study

Sr. No.	Paper Title	Author/ Publication	Technology	Advantage	Disadvantage
1.	Theoretical foundations of automated control	Tarek Abdelzaher (2006)	This paper provides an introduction to control theory for computing practitioners with an emphasis on applications in the areas of database systems.	It helps user to discover valuable information, This system has better scalability and accuracy.	Insufficiency of information.
2.	Expose: An ontology for data mining experiments	Yuriy V. Lonchakov ; Àndrey A. Kuritsyn ; Vladimir I. Yaropolov	The paper shows historical aspects of the application of computer-based information systems, providing the process of cosmonaut training for a space flight	Database store the result of cosmonaut training, It is used to generate content in a short period.	It is too much complicated system.
3.	Information Technologies of Training Cosmonauts for a Space Flight	Craig McCormack a, Olga Bannovab, Sheryl Bishopc, Jorge D. Cambab	Crew exposure to all or some of these difficulties, crewmembers may not be able to perform at their best capacity and fulfil their mission requirements.	It has good Environment.	Complication on a long space flight beyond the Earth. Due to some difficulties, crewmembers may not fulfil their mission.

VI. PROBLEM STATEMENT

Cosmonaut coaching is one in all the foremost necessary problems with the manned flights programs, which has medical tests, physical coaching, extra-vehicular activity coaching, procedure coaching, rehabilitation method, furthermore as coaching on experiments they're going to accomplish throughout their keep in house. Advances within the exploration and habitation of house environments over the last period of time have set the stage for long-duration expeditions on the far side Earth orbit. Many humans have currently participated in missions that needed the occupancy of satellite vehicles or house stations for periods of up to many months or in some cases a year or additional beneath usually adverse environmental and behavioural conditions. Cosmonauts a like in agreement that the foremost difficult social issues weren't among the crew members.

VII. PROPOSED SYSTEM

In the proposed system the stage of development of computing facilities allows to solve this problem through the use of AI. In this particular case of crew training, the artificial intelligence is understood as an ability of automatic or automated systems to perform the functions of

human intelligence, that is, to make optimal decisions on the basis of the gained experience and analysis of the external influences. Proposed system improves quality of training by conducting online test. Situation awareness has three levels and once these levels are interpreted and understood correctly, they can be applied to events or they can be used to predict future events The SA teaching agent will utilise supervised learning and will use a database, established in consultation with domain experts, to recognise patterns in the input data so as to classify student behaviour as examples of good or poor SA.

VIII. ALGORITHM

Simple Linear Regression Algorithm

In ML, have got a group of input variables (x) that square measure want to verify the output variable (y). A relationship exists between the input variables and also the output variable.

Simple Linear Regression(SLR) could also be outlined because the applied mathematics model that analyzes the linear relationship between a variable quantity with given set of freelance variables. Linear relationship between variables implies that once the worth of 1 or additional freelance variables can amendment (increase or decrease), the worth of variable quantity will amendment consequently (increase or decrease).

Mathematically the link will be depicted with the assistance of following equation: –

$$Y = mX+b$$

Here, Y is that the variable quantity we have a tendency to try to predict.

X is that the experimental variable we have a tendency to square measure exploitation to create predictions.

m is that the slop of the regression curve that represents the impact X has on Y.

b may be a constant, referred to as referred to as.

If X = 0, Y would be adequate bb.

Step 1: Import necessary packages

Step 2: Define coef_estimation(x, y)function which can calculate the necessary values for SLR

Step 3: Calculate the quantity of observations(n) needed

Step 4: Calculate the subsequent for every observation one by one

a. Mean of x and y vector

b.Cross-deviation and deviation concerning x variable

c. Regression coefficients

Step 5: Predict the response vector

Step 6: Plot constant on the response line exploitation the linear co-effcient on the imagined line y = mx+c

Step 7: Repeat Step 2-5 until n

Step 8: Finish

IX. MATHEMATICAL MODEL

- Equation of artificial neural network is-

$$y = f\ (w1x1+ w2x2 + w3x3 + w4x4 + ... + wnxn +b)$$

Here, Y is the output.

w is the weight.

x is the input.

b is the bias.

- The Cost function for Simple Linear regression algorithm as-

$$Cost(C, (y^i, y)) = \frac{1}{2}(y^i - y)^2$$

y^i is the output value,

is the actual value, C is the cost.
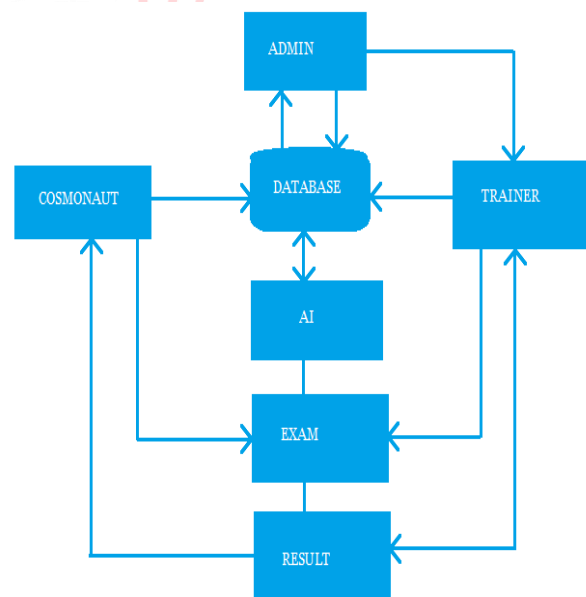
X. SYSTEM ARCHITECTURE

Fig 1: System Architecture

Admin controls all the system activities like registered users, login info, exam and result till sending the offers to the cosmonauts. After registration of each trainer and cosmonauts that data is verified by admin, then admin activates Trainer and cosmonauts. After activation only trainer and cosmonauts are able to login to the system. Trainer sets exam for cosmonauts. Trainer checks paper and give score and then submit that exam result data to the admin.

Cosmonauts give all the exams one after another by scoring good marks in previous exam. And finally, according to score admin sends offer to the cosmonauts.

XI.   ADVANTAGES

- Understand the goals, objectives, functions of the complete system of crew coaching with the utilization of integrated and special purpose simulators.
- Provide and use the mandatory knowledge at numerous levels of coaching, conferred within the variety of data flow diagrams.
- In the method of crew coaching reduces the instructor's labor contribution.
- Master the methodology of making abstract and information-logical models, that mirror the interconnection of data.
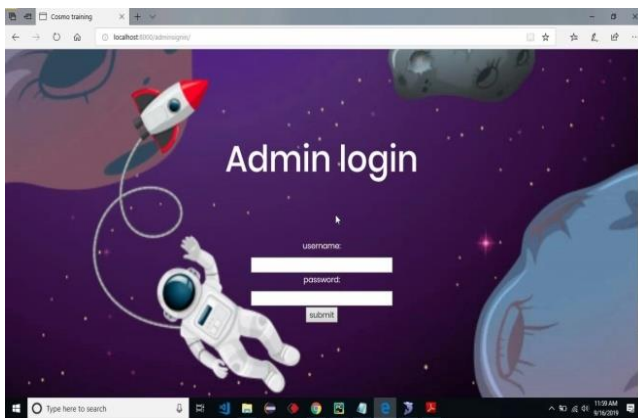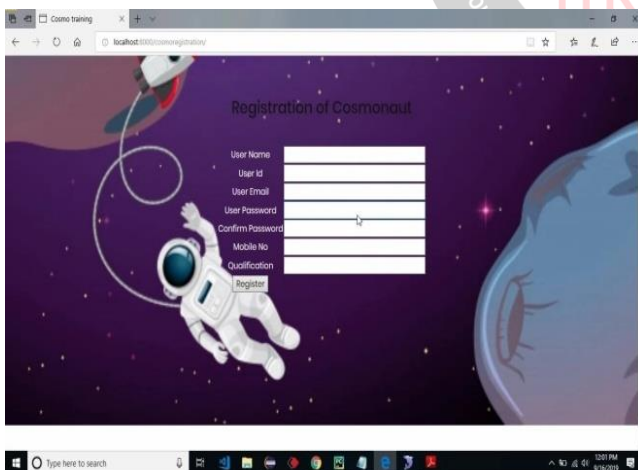
XII.   DESIGN DETAILS

Fig 2: Admin Login

Fig 3: Registration

XIII. CONCLUSION

Thus we have tried to implement the paper "Andrey Kuritsyn FBSO, Yu. A. Gagarin Research & Test Cosmonaut Training Center", "Application of artificial intelligence in process of crew training", IEEE access 2018. The automated control of comprehensive simulator training of orbital space station crews requires the synthesis of

software and information support of modular AI systems in order to create integrated automated training systems. This will create it to introduce a cosmonaut's individual coaching, taking into consideration his temperament, to compile his "passport", which can contain information on his successes in mastering the course content, check take a look at results, etc. Based on these data, the system will allow generating additional tests and tasks for more successful mastering.

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