



Evaluating Student Academic Achievement in an Engineering Program using Machine Learning techniques

¹. E. Benitha Sowmiya ²k.Sagar ³L.Bharadwaz ⁴M.Surya raga vendhra

¹Assistant professor, Department of Computer Science and Engineering, Bharath Institute of Higher Education And Research, Chennai, India- 600073 .

^{2, 3,4,5} Student , Department of Computer Science and Engineering, Bharath Institute of Higher Education And Research, Chennai, India- 600073.

Abstract: In recent years, the integration of machine learning techniques into educational assessment has garnered significant attention due to its potential to provide valuable insights into student performance and academic achievement. This study aims to evaluate student academic achievement in an engineering program through the application of machine learning algorithms. The research utilizes historical academic data, including grades, exam scores, and other relevant metrics, to train and test various machine learning models. These models are then employed to predict student performance and identify key factors influencing academic success within the engineering curriculum. Through rigorous analysis and comparison of different machine learning approaches, this study seeks to provide valuable insights into enhancing educational practices and facilitating personalized learning strategies within engineering programs. The findings of this research have the potential to inform educators, administrators, and policymakers in designing more effective interventions and support mechanisms to enhance student success in engineering education.

Keywords: Student Level, Behaviour, Monitoring, Online Class, Artificial Intelligence

I. INTRODUCTION

There are numerous studies in which researchers have attempted to attract college students' attention. Many of these approximations lack quantitative evaluation and are primarily based on qualitative evaluation. This artistic creations thus targets to connect the distance among subjective and quantitative methodologies to developing understudy commitment. This study therefore routinely divides college students into attentive and inattentive RGB-D sensor statistics using machine learning algorithms (K-manner and SVM). The National Academy of Engineering has done a lot of research on this topic, and the findings of this study can be used to inform and support teaching methods for teachers of all levels. The

ability of teachers to implement individualized learning methods is a major goal of their work. In this view, contraption learning calculations are utilized for educational purposes.

II. OBJECTIVE

Many investigations had been completed at the IIIclimate. The vast majority of these examinations confided in subjective instead of quantitative ways to deal with aptitude and estimating care.

III. RELATED WORK

3.1 A Technique for Investigating Understudy Consideration in a Disconnected Homeroom In light of Profound Learning/Xiufeng Lin, Jie Yang, Jingxin Liang, Huaizhong Zhu and Hui Sun

It is totally a reading up diversion for school kids in workforce This is the thing we call learning interest, and that is the key sign utilized It are estimated to Learn results. Get exact assessment of understudy interest disconnected Classes are a basic observational glance at by further developing educators' instructing techniques. This paper proposes a way for getting and estimating understudy execution. Work in superbness the utilization of assortment Shares profound concentrating on models proactively every species in a chain of seasons. They had been separated into four states: Reading and business; Preparing and Record. After video and sound Data is to be had through the Web of Things (IoT). Innovation, Retina face and Vision inside the Homeroom A variant transformer (VIT) is utilized for face discovery and Uncover the boundaries of the researcher's head present. Understudies have substantially less open doors Investigate the innovation. Time usage transforms into an issue Far off understudies discipline Logging or another sort of measurements isn't permitted. Understudies who are not accessible 100% of the time to be disregarded by utilizing polish or later associations.

3.2. *Disciples Work Tomorrow and The device is installation Online instructions Use of the face Signs/Mughal Lata Roy; Mr. Illness; J. Mr. Dorothy Jayasili*

Through the blessings of net and modernity Innovation is viable Lead and lead and be prepared in day by day instructions Academic critiques of college students More remote organizations. All this turned into executed More from recent lows Working life of students and instructors Online part however such He has no coaching text Intuitive human conversation and Correspondence, any kind of frame He has education. To increase Online mastering revel in, instructors So it's useful to have a few motives So they forestall with the disciple Focuses on line periods. Facial remedy Face reputation and authentication We have made superb progress lately Over the years and in numerous ways To make it easier for human beings to get to understand every different and segmentation of the face. This machine normally calls for the effort of the instructor. Due to immoderate obedience. A usual lesson Style has a terrible impact on students Focus, attention and retention, secondly many research and reviews.

3.3. *Measuring Student Attention Using Convolutional Neural Networks/Andrea Goja Ia and Katelyn V. Rusu 1,2 b*

In this look at, we recommend a technique for measuring pupil attention primarily based on Gabor filters, convolutional neural networks, and help vector machines (SVM). The first step uses a Gabor filter to extract the inner faces. An active neural community implements this preliminary transformation and performs SVM category in the very last layer. To do that, we created our own photograph dataset. The dataset includes a stay movement dataset of Karolinska manufacturers, real on line excessive faculty training, and pictures from volunteers. Our version compares very as it should be with different convolutional fashions including AlexNet and GoogleNet. A hassle of the curve is that it cannot appropriately represent how a signal is processed by using a non-linear or time-various device. So it truly comes right down to figuring out whether audio structures and analog systems are linear time invariant (LTI) systems.

3.4. *A system for monitoring scholar attention in a getting to know environment primarily based on synthetic intelligence / Juan David Martínez-Vargas, Paula Andrea Rodríguez Marin, Leonardo Duque Muñoz*

A pupil's level of know-how of a topic is a aspect that gives them the capacity to take into account the idea discovered and observe it later. As a result, centred students carry out better inside the mastering/teaching manner than people who do now not, and for this reason obtain better academic performance. Therefore, it's miles important for instructors to expand strategies and tools that help them reveal college students' interest stages non-invasively, letting them exchange dynamic activities while wanted. In this paper, we present a completely computerized machine for scholar interest monitoring based on pc vision algorithms. The use of AI in training has many blessings for students and instructors: they can get right of entry to getting to know resources from everywhere at any time. Time-ingesting and tedious tasks like registration or step-with the aid of-step testing of a couple of assessments may be completed with the assist of AI automation. A frequently asked question can be answered in a single manner.

3.5. *AttenQ - An Effective Tool for Online Learning / Pooja Khoshti, Arya Paryani, Juhi Talreja, Vidya Job*

The international Covid-19 pandemic has prompted establishments around the sector to close down and switch to virtual versions of the classroom. According to the studies performed, it's far determined that the distance of students is gradually lowering because of online gaining knowledge of technique. It could have a horrific impact on mental performance. To resolve this hassle, we aim to expand a system to screen pupil pastime in magnificence. Concentration is fundamental to effective mastering. Hence, it plays an vital position within the mastering technique of the kid. The amount of time a toddler spends taking note of and knowledge statistics from a instructor in a lesson impacts how tons the kid learns from the lesson.

Topic: AUTHOR

In the cutting-edge machine, student behaviours along with logging in, logging in, and navigating between web pages; Path of conduct. Path behaviour is a extensive category of conduct and in particular mastering. Behaviour When a learner locates a selected sort of useful resource, this conduct includes both exploration behaviour and aid exploration conduct. And behavioural pathways. There is a difference between the trajectory of behaviour and the ability to research conduct Behavioural assist for getting to know includes bodily exploration, and follows behaviour most effective to retrieve the action, now not Therein lies the primary trouble of control.

Disadvantages of Existing System

These consist of increasing the complexity and uncertainty of the version, introducing biases and errors into the model, and limiting the generalizability and adaptableness of the version. This makes schooling and optimizing the version very hard, in particular for small or noisy records units.

IV. PROPOSED SYSTEM

This paper portrays a device that utilizes a modern computerized camera to screen, be counted, and record understudies' signals, perspectives, and looks. Articulations and verbalizations to achieve measurements to decide understudy interest. Machine dominating calculations are then used to gathering, mark and supplement realities for ensuing additions. Have understudies pay interest or sign. This contraption is a vital stage in the improvement of the proposed customized concentrating on device characterized on this paper. Research alludes to the investigation of proclamation. Eyes and head tracks had been widely used to decide Looks are utilized to decide understudy precision in exploratory pc organizations.

SVM- An assist vector with machining (SVM) is a powerful framework getting to know calculation that SVM might be utilized for different commitments comprehensive of printed content grouping, picture classification, spam location, hand fame, hereditary examination, face recognition and irregularity identification. SVMs are appropriate and valuable in different applications because of the reality they can manage high-layered structures and non-straight connections. SVM calculations are bright green because of

the reality we endeavor to find the greatest isolating hyper plane between the remarkable preparations that anyone could hope to find inside the objective item.

V. SYSTEM ARCHITECTURE

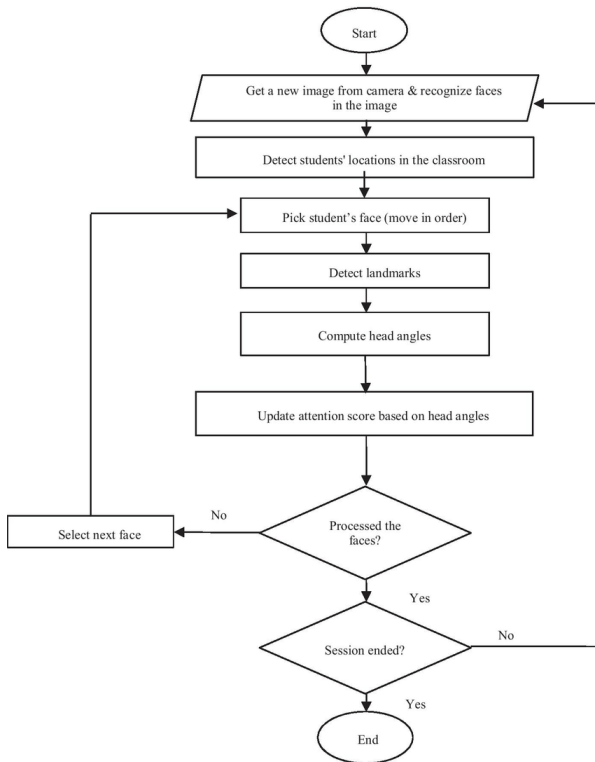


FIG 5.1 BLOCK DIAGRAM

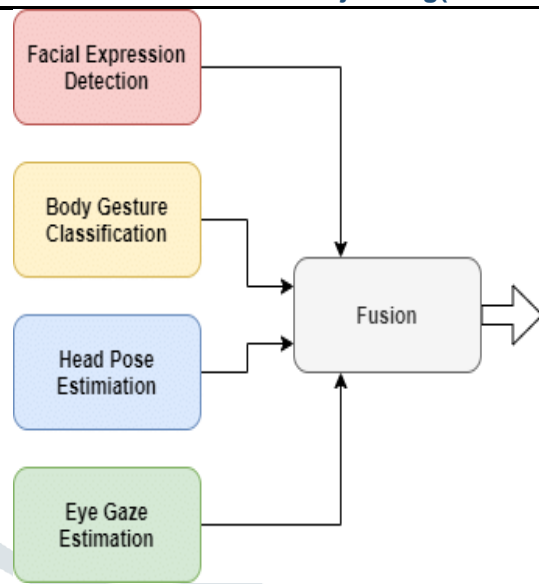


FIG 5.2 ARCHITECTURE DIAGRAM

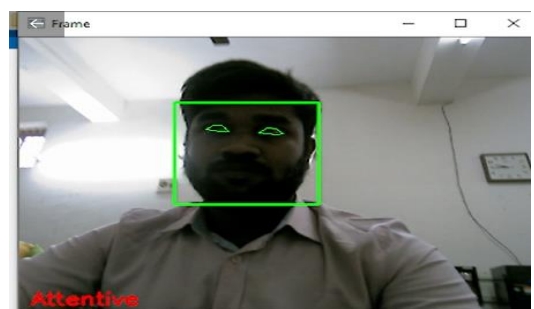
VI. MODULES

6.1 EXPLANATION:

“Evaluating student academic achievement in an engineering program using machine learning techniques” refers to using data-driven approaches, specifically machine learning algorithms, to assess and predict student’s performance in an engineering curriculum. This involves collecting relevant data such as grades, attendance records, test scores, and other factors, and then applying machine learning to analyze patterns, identify trends, and make predictions about student,s future academic achievements. By doing so, educators and administrators can gain insights into student performance, identify at-risk students early, and potentially implement interventions to support their success.

6.2 PREPROCESSING:

- 1.Data Collection: Gather data on student demographics, academic history, course grades, test scores, attendance records, and any other relevant factors.
- 2.Data Cleaning: Handle missing values, outliers, and inconsistencies in the data. This may involve imputation, removal, or correction of erroneous entries.
- 3.Feature selection/Engineering: Identify relevant features that may influence academic achievement, such as GPA, attendance rate, class difficulty, etc. this may involve domain knowledge or statistical techniques like correlation analysis.



VII. CONCLUSION

We have observed that in a concentrating on school there is bunches of exchange among educators and understudies, understudies are likewise designated on their acquiring information on, and that cooperation brings about a more serious level of support, that is something vital in expanding researcher consideration. Understudy interest might be ventured forward by utilizing presenting project-based absolutely acquiring information on and expanding intelligent dominating substance material. Also, we found that it was fair-minded of site choice. This paper utilizes an observably little dataset to educate and adopt a glance at our strategy; For this thought process, it's miles vital to gather more pictures of various sorts and undergrads to produce additional specific information to educate and adopt a glance at our strategy in achieving studies. To utilize this method, equipment and programming designs ought to secure and translate video and sound realities. Low-charge, minimized devices can be developed to satisfy those necessities. He became extra mindful of the primary front than the back.

VIII. REFERENCES

- [1] P.Veeramuthu Dr.R.Periasamy "Application of Higher Education System for Predicting Student Using Data mining Techniques" International Journal of Innovative Research in Advanced Engineering (IJRAE) ISSN: 2349- 2163 Volume 1 Issue 5 (June 2015)
- [2] Umesh Kumar Pandey, S. Pal "A Data Mining view on Class Room Teaching Language" IJCSI International Journal of Computer Science Issues, Vol. 8, Issue 2, March 2011 ISSN (Online): 1694-0814
- [3] Mrs. M.S. Mythili, Dr. A.R.Mohamed Shanavas "An Analysis of students' performance using classification algorithms" IOSR Journal of Computer Engineering (IOSR-JCE) e-ISSN: 2278-0661, p- ISSN: 2278-8727 Volume 16, Issue 1, Ver. III (Jan. 2014), PP 63-69
- [4] G.Paul Suthan and Lt.Dr. Santhosh Baboo "Hybrid CHAID a key for MUSTAS Framework in Educational Data Mining" IJCSI International Journal of Computer Science Issues, Vol. 8, Issue 1, January 2011 ISSN (Online): 1694-0814
- [5] Ayinde A.Q, Adetunji A.B "Investigating the Performance of Selected Weka Classifiers for Knowledge Discovery in Mining Educational Data" Information and Knowledge Management www.iiste.org ISSN 2224-5758 (Paper) ISSN 2224-896X (Online) Vol.5, No.5, 2015
- [6] S. T. Hijazi, and R. S. M. M. Naqvi, "Factors Affecting Student's Performance: A Case of Private Colleges", Bangladesh e-Journal of Sociology, Vol. 3, No. 1, 2006.
- [7] Y. Ma, B. Liu, C.K. Wong, P.S. Yu, and S.M. Lee, "Targeting the Right Students Using Data Mining", Proceedings of KDD, International Conference on Knowledge discovery and Data Mining, Boston, USA, 2000, pp. 457-464.
- [8] S. Kotsiantis, C. Pierrakeas, and P. Pintelas, "Prediction of Student's Performance in Distance Learning Using Machine Learning Techniques", Applied Artificial Intelligence, Vol. 18, No. 5, 2004, pp. 411-426.
- [9] P. Cortez, and A. Silva, "Using Data Mining to Predict Secondary School Student Performance", In EUROSIS, A. Brito and J. Teixeira (Eds.), 2008, pp.5-12.26
- [10] A. L. Kristjansson, I. G. Sigfusdottir, and J. P. Allegrante, "Health Behavior and Academic Achievement Among Adolescents: The Relative Contribution of Dietary Habits, Physical Activity, Body Mass Index, and Self-Esteem", Health Education & Behavior, (In Press).
- [11] J. A. Moriana, F. Alos, R. Alcalá, M. J. Pino, J. Herruzo, and R. Ruiz, "Extra-Curricular Activities and Academic Performance in Secondary Students", Electronic Journal of Research in Educational Psychology, Vol. 4, No. 1, 2006, pp. 35-46.
- [12] M. Bray, the Shadow Education System: Private Tutoring and Its Implications For Planners, (2nd ed.), UNESCO, PARIS, France, 2007.
- [13] Q. A. Al-Radaideh, E. M. Al-Shawakfa, and M. I. AlNajjar, "Mining Student Data using Decision Trees", International Arab Conference on Information Technology (ACIT'2006), Yarmouk University, Jordan, 2006.
- [14] Ch. Aswani Kumar; K. Sumangali," Performance evaluation of employees of an organization using formal cept analysis", International Conference on Pattern Recognition, Informatics and Medical Engineering (PRIME-2012)
- [15] Shaomei Yang; Qian Zhu, "An Evaluation Model on Employee Performance Based on Improved BP Neural Network", 2008 4th International Conference on Wireless Communications, Networking and Mobile Computing.
- [16] TANG Yu-fang, ZHANG Yong-sheng,, —Design and cimplementation of college student information management system based on the web servicesl. Natural Science Foundation of Shandong Province (Y2008G22), 978-1- 4244-3930-0/09 2009 IEEE.
- [17] TANG Yu-fang, ZHANG Yong-sheng,, —Design and implementation of college student information management system based on the web servicesl. Natural Science Foundation of Shandong Province (Y2008G22), 978-1- 4244-3930-0/09 2009 IEEE.
- [18]]H. Aldowah, H. Al-Samarraie and W. M. Fauzy,"Educational data mining and learning analytics for 21stcentury higher education: A review andsynthesis", Telematics Informat., vol. 37, pp. 13-49, Apr.2019
- [19] "Student's Performance Prediction Using Weighted Modified ID3 Algorithm" - International Journal ofScientific Research Engineering & Technology (IJSRET), ISSN 2278 – 0882 Volume 4, Issue 5, May 2015.
- [20] N. Ruijs and H. Oosterbeek, "School choice in Amsterdam: Which schools are chosen when schoolchoice is free?", Educ. Finance Policy , vol. 14, no. 1, pp. 1-30, Jan. 2019