

TRAUMATIC BRAIN INJURY PREDICTION AND MONITORING SYSTEM OF PATIENTS

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Abstract — Traumatic brain injury TBI is one among the foremost common varieties of Neurotrauma that has affected quite 250,000 military service members over the last decade alone. Where as in battle, service members WHO expertise TBI area unit at vital risk for the event of traditional TBI symptoms, likewise as risk for the event of psychological disorders like Post-Traumatic Stress Disorder PTSD. As such, these service members usually need intense bouts of medication and medical care so as to resume full return-to-duty standing. The first aim of this study is to spot the link between the administration of specific medications and reductions in symptomatology like headaches, dizziness, or light-headedness. Service members diagnosed with mTBI and seen at the Concussion Restoration Care Center CRCC in Asian nation were analyzed in keeping with prescribed medications and symptomatology. Here, we tend to demonstrate that in such things with thin labels and tiny feature sets, classic analytic techniques like supplying regression, support vector machines, nave Bayes, random forest, call trees, and k-nearest neighbor don't seem to be like minded for the prediction of outcomes. We tend to attribute our findings many to many problems inherent to the present downside setting and discuss several blessings of spectral graph ways.

Keywords: Graphcuts, fMRI, Application

I. INTRODUCTION

Evidence based decision making is seen as one of the central goals for healthcare transformation in the coming decade. Due to innovative advances in biomedical techniques such as genome sequencing, protein identification, medical imaging, and the use of secondary patient information, tremendous amounts of Electronic Health Data (EHD) are generated every day. A primary aim of this paper is to illustrate some of the limitations in using classic parametric analytic techniques in identifying relationships among treatments and patient outcomes in the context of TBI/PTSD applications. Here, we introduce a graph theoretic approach for analyzing EHD to investigate the relationship between medications, neuropsychiatric symptoms, and treatment outcomes and show that when the data is limited, noisy, and sparse, that such approaches can outperform a wide variety of machine learning methods, such as logistic regression, in terms of classification accuracy.

II. PROBLEM STATEMENT

To monitor the possibilities of diseases from patients current symptoms matching with the symptoms present in database for early detection of diseases.

III. EXISTING SYSTEM

Earlier we couldn't predict the symptom, if we find some symptom then we couldn't find the actual disease. Because same type of symptom comes under different diseases. By facing this major problem we develop our new system to find the solution of a problem.

IV. LITERATURE REVIEW

According to literature survey after studying different IEEE paper, collected some related papers and documents some of the point discussed here:

1. Unified and Contrasting Cuts in Multiple Graphs: Application to Medical Imaging Segmentation

Author: Chia-Tung Kuo, et.al.

Description: In this paper we have a tendency to study 2 such questions: i) For assortment{a set|a group} of graphs realize one cut that's smart for all the graphs and ii) for 2 collections of graphs realize one cut that's smart for one collection however poor for the opposite. We have a tendency to show that existing formulations of multi view, agreement and various clump cannot address these queries and instead we offer novel formulations within the spectral clump framework. we have a tendency to judge our approaches on practical resonance imaging (fMRI) knowledge to deal with queries such as: "What common psychological feature network will this cluster of people have?" and "What square measure the variations within the psychological feature networks for these 2 groups?" we have a tendency to get helpful results while not the requirement for sturdy domain information.

2. Spectral Clustering for Medical Imaging

Authors: Chia-Tung Kuo, et.al.

Description: In this paper we have a tendency to commit to alter the method of Laplacian creation with the assistance of steering towards the applying focus. In most domains making a basic Laplacian is plausible, thus we have a tendency to propose adjusting this given Laplacian by discovering vital nodes. We have a tendency to formulate this drawback as associate number linear program with an explicit

geometric interpretation that is globally decreased exploitation giant scale solvers like Gurobi. We have a tendency to show the utility on a true world drawback within the space of fMRI scan segmentation wherever ways exploitation normal Laplacians perform poorly.

3. Effects of Low-Level Blast Exposure on the Nervous System: Is There Really a Controversy?

Authors: Gregory A. Elder, et.al.

Description: We review blast injury modeling in animals noting that inconsistencies in experimental approach have contributed to uncertainty over the consequences of low-level blast. Yet, animal studies show that low-level blast pressure waves are transmitted to the brain. In brain, low-level blast exposures cause activity, organic chemistry, pathological, and physiological effects on the system as well as the induction of PTSD-related activity traits within the absence of a psychological agent. We tend to review the connection of blast exposure to chronic neurodegenerative diseases noting the self-contradictory lowering of a beta by blast that at the side of different observations counsel TBI is distinct from non-blast TBI. Human neuroimaging studies show that blast-related mTBI is related to a spread of chronic effects that are unlikely to be explained by co-morbid anxiety disorder. We tend to conclude that rife proof supports low-level blast as having semi permanent effects on the system.

4. Anam4 tbi reaction time-based tests have prognostic utility for acute concussion

Author: LT Jacob N. Norris, et.al.

Description: The Concussion Restoration Care Center has used the automatic psychological science Assessment Metrics version four Traumatic Brain Injury (ANAM4 TBI) battery in clinical assessment of concussion. The study's aim is to judge the prognostic utility of the ANAM4 TBI. In one hundred sixty five concussed active duty personnel (all ultimately came back to duty) seen and tested on the ANAM4 TBI on days three and five (median times) from their injury, Spearman's ρ statistics showed that each one performance subtests (at day 5) were related to fewer days return-to-duty (RTD) time, whereas concussion history or age didn't. Loss of consciousness, and post-traumatic state of mind were related to accrued RTD time; ANAM4 TBI reaction time-based subtests, conjointly, showed the most important impact sizes. A survival analysis employing a Kaplan–Meier plot showed that the bottom twenty fifth on the reaction time-based subtests had a median RTD time of nineteen days, whereas those within the higher twenty fifth had a median RTD time of roughly seven days. Results indicate that till valid neuro psychological feature testing is introduced, the ANAM4 TBI battery, particularly reaction time-based tests, has prognostic utility.

V. MATHEMATICAL MODEL

$H (P1:S1,S2,S3,S4:D), (P2:S1,S2,S3:D), (P3:S1,S2,S3,S4:D)$

I G, U

G set of current symptom in user U g_1, g_2, g_3, g_4

Processing: Using Greedy approach

O set of possible output Extract keyword kn from gn

1) Match kn into H set.

2) If match found

3) If Sn belongs to Pn

Add Pn into O.

Perform steps 1 and 2 for Sn is empty for Pn

From set O,

For each P check value of D.

Show result set of D to user U.

VI. EXISTING SYSTEM

Earlier we couldn't predict the symptom, if we find some symptom then we couldn't find the actual disease. Because same type of symptom comes under different diseases. By facing this major problem we develop our new system to find the solution of a problem.

VII. PROPOSE SYSTEM

In Propose system we introduce a graph theoretic approach for analyzing EHD to investigate the relationship between medications, neuropsychiatric symptoms, and treatment outcomes and show that when the data is limited, noisy, and sparse, that such approaches can outperform a wide variety of machine learning methods, such as logistic regression, in terms of classification accuracy. We illustrate the robustness of a graph-based representation of the dataset to develop predictive models of patient outcomes.

VIII. SYSTEM ARCHITECTURE

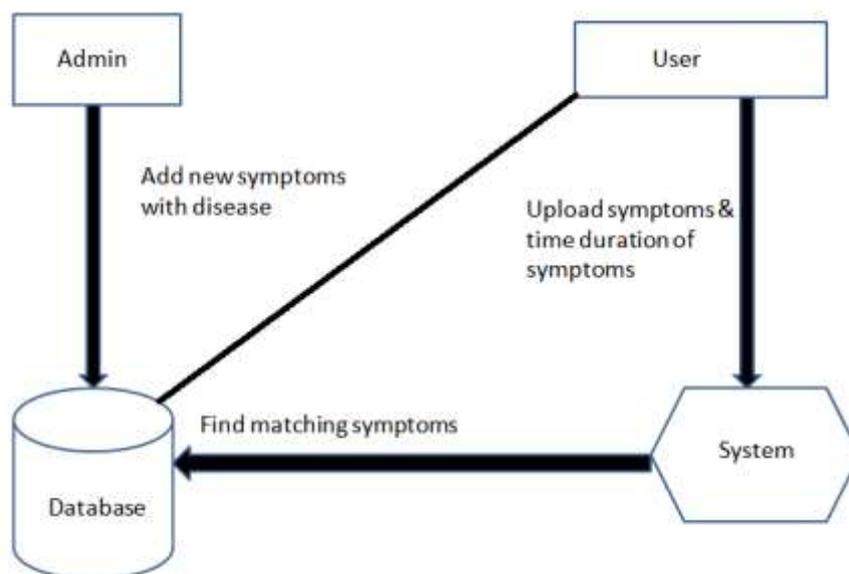


Figure.5.1 System Architecture

IX. RESULT

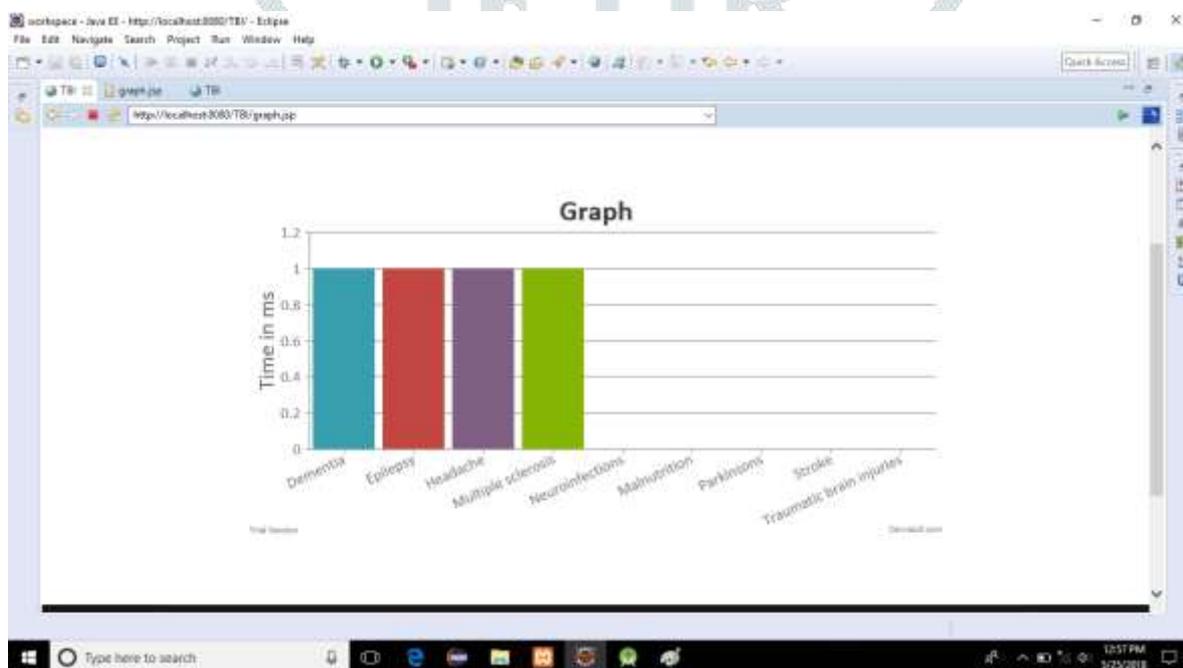


Figure.6.1 Result

X. APPLICATION

Health record system

XI. CONCLUSION AND FUTURE SCOPE

We generate System which is use for find out possibilities of diseases from users current symptoms matching with other patients positive disease history with symptom. Propose system offered a different approach that focused on the use of graphs as a means to model complexities between patient symptoms and treatment outcomes. Of course, there represent other possible approaches to representing these types of data and future research should continue to explore the extent to which these approaches provide for accurate classification especially in those cases with sparse data.

XII. REFERENCES

[1] Chia-Tung Kuo, et.al. Unified and Contrasting Cuts in Multiple Graphs: Application to Medical Imaging Segmentation
 [2] Dunham, M. H. Data Mining: Introductory and Ad-vanced Topics, New Jersey, USA: Prentice Hall.
 [3] Elder, Gregory A., James R. Stone, and Stephen T. Ahlers. "Ef-fects of low-level blast exposure on the nervous system: is there really a controversy?." Frontiers in neurology 5 (2014).
 [4] Reeves, D.L., Winter, K.P., Bleiberg, J., Kane, R.L. ANAM4 Genogram: Historical perspectives, description, and current endeavors. Arch ClinNeurPsych 22, 15-37.

- [5] Norris, J.N., Sams, R., Lundlad, P., Frantz, E., Harris, E. Blastrelated mild traumatic brain injury in the acute phase: Acute stress reactions partially mediate the relationship between loss of consciousness and symptoms. *Brain Inj* 28, 1052-1062.
- [6] Hoge, C.W., McGurk, D., Thomas, J.L., Cox, A.L., Engel, C.C., Castro, C.A. Mild traumatic brain injury in U.S. soldiers returning from Iraq. *New Engl J of Med* 358, 453-463.
- [7] Friedl, K.E., Grate, S.J., Proctor, S.P., Ness, J.W., Lukey, B.J., Kane, R.L. Army research needs for automated neuro-psychological tests: Monitoring soldier health and performance status. *Arch ClinNeuropsychol* 22S, S7-S14.
- [8] Wang, F. (2015). Adaptive semi-supervised recursive tree partitioning: The ART towards large scale patient indexing in personalized healthcare. *Journal of biomedical informatics*.
- [9] Norris, J.N., Carr, W., Herzig, T., Labrie, W., Sams, R. (2013). ANAM4 TBI reaction time-based tests have prognostic utility for acute concussion. *Military Med* 178, 767-774.
- [10] Fayyad, U. M., Piatetsky-Shapiro, G., and Smyth, P. From Data Mining to Knowledge Discovery in Databases, *AI Magazine*, 17(3), 37-54.
- [11] Ian Davidson, Sean Gilpin, Peter B. Walker, Behavioral event data and their analysis.
- [12] Xiang Wang, Ian Davidson, Flexible constrained spectral clustering.
- [13] Chia-Tung Kuo, Peter B. Walker, Owen Carmichael, Spectral Clustering for Medical Imaging, *Data Mining (ICDM)*
- [14] Kuo, C. T., Wang, X., Walker, P., Carmichael, O., Ye, J., Davidson, I. (2015, August). Unified and Contrasting Cuts in Multiple Graphs: Application to Medical Imaging Segmentation. In *Proceedings of the 21th ACM SIGKDD International Conference on Knowledge Discovery and Data Mining* (pp. 617-626). ACM.
- [15] Spira, J.L., Lathan, C.E., Bleiberg, J., Tsao, J.W. (2014). The impact of multiple concussions on emotional distress, post-concussive symptoms, and neurocognitive functioning in active duty United States marines' independent of combat exposure or emotional distress. *J Neurotrauma* 31, 1-12.
- [16] Phillips, H. L., Walker, P. B., Kennedy, C. H., Carmichael, O., Davidson, I. N. Guided learning algorithms: An application of constrained spectral partitioning to functional magnetic resonance imaging (fmri). In *Foundations of Augmented Cognition* (pp. 709-716). Springer Berlin Heidelberg.
- [17] Doshi-Velez, F., Ge, Y., Kohane, I. (2014). Comorbidity clusters in autism spectrum disorders: an electronic health record time-series analysis. *Pediatrics*, 133(1), e54-e63.

