

VESIT - Dr. Akshay Ranade's Tooth Tickle Dental Clinic and Implant Centre

Memorandum of Understanding for

A Proposal by Department of Computer Engineering of
Vivekanand Education Society's Institute of Technology (VESIT)
Hashu Advani Memorial Complex, Collector's Colony, Chembur, Mumbai, Maharashtra

Dr. J. M. Nair
Principal, VESIT

Dr. Nupur Giri (H.O.D)
Department of Computer Engineering, VESIT

&

Dr. Akshay Ranade
Founder, Tooth Tickle Dental Clinic and Implant Centre



101, Gurukrupa 1st Floor, Veer Savarkar Marg, opp.
Maharashtra Vidyalaya, Naupada, Thane, Maharashtra 400602

Memorandum of Understanding

This MEMORANDUM OF UNDERSTANDING (MOU) is entered on 07-10-2022 by and between:

Dr. Akshay Ranade's Tooth Tickle Dental Clinic and Implant Centre located at 101, Gurukrupa 1st Floor, Veer Savarkar Marg, opposite Maharashtra, Vidyalaya, Naupada, Thane, Maharashtra 400602 (here in after referred to as the "**Tooth Tickle**" which expression shall unless excluded by or repugnant to the context, be deemed to mean and include its successors-in interest, assigns and affiliates)

AND

Vivekanand Education Society's Institute of Technology (VESIT), Department of Computer Engineering, located at Hashu Advani Memorial Complex, Collector's Colony, Chembur, Mumbai 400074 (here in after referred to as the "**VESIT-CMPN**" which expression shall unless excluded by or repugnant to the context, be deemed to mean and include its successors-in interest, assigns and affiliates)

WHEREAS,

Whereas, **Vivekanand Education Society's Institute of Technology (VESIT)**, at its various engineering departments is charged with responsibility of imparting technical knowledge and expertise and professional excellence in Technology by undertaking industrial & applied research and consultancy and the **Department of Computer Engineering** adheres to all principles of the institution.

WHEREAS, both **Tooth Tickle** and **VESIT-CMPN**, now

Desiring to club their efforts by pooling their respective expertise and resources, recognizes the importance of research and development in the areas of social and recent interests as well as imparting real-life solutions by above both, appreciating the need for the creation of a large reservoir of highly qualified manpower in all fields related to engineering, dental, TMJ disorders (diagnosis and therapy) and technology.

Tooth Tickle and **VESIT-CMPN** on are also referred to as the "**Parties**" in the collective and as the "**Party**" in the singular

NOW, THEREFORE, in consideration of the mutual promises made herein and of good and valuable consideration, the receipt and sufficiency of which both **Tooth Tickle** and **VESIT-CMPN** hereby acknowledge, **Tooth Tickle** and **VESIT-CMPN** hereby agree to sign a memorandum of understanding (MOU).

1. This MOU between **Tooth Tickle** and **VESIT-CMPN** is executed with the objective of fostering collaboration between the two institutions to promote industrial and academic interaction to help enhance the pool of student talent ("Collaboration"), The Collaboration here under shall commence on 30-09-2022 and will be valid for **one** year from the date of commencement.



2. **VESIT-CMPN** shall make available appropriate infrastructure facilities for the Collaboration, which may include general access to the facilities, faculty, staff, teaching content, classrooms, library facilities, computer and communication facilities, stationery and other materials as may be required for the various programs to be offered. This shall however be subject to the requirements of clause 6 below.

3. **Tooth Tickle** shall make available appropriate data, information, knowledge, procedures, and process for the collaboration, which includes access to its highly confidential patient data, etc as deemed necessary. All this shall however be subject to the requirements of clause 6 below.

4. This Collaboration is non-exclusive and each party shall be free to enter into similar collaborations with other institutions/organizations.

5. Neither party shall:

- A. Infringe the intellectual property belonging to the other party
- B. Use any trade name, trade mark, symbol or designation belonging to the other without prior written approval of the other party
- C. Be or represent itself as a representative of the other
- D. Create any liability for the other The parties shall keep the other indemnified against the breach of this clause

6. Confidential Information shall mean all proprietary information or data furnished by either Party and/or its affiliates before or after the Effective Date hereof, whether written or oral which includes but is not limited to Parties trade secrets, processes, devices, designs, concepts, improvements, know-how, algorithms, models, inventions (whether or not patentable or copyrighted), developments, decision technology, specifications, techniques, patient data, patient's CBCT scan, sketches, works of authorship, applications processes, strategies, designs, photographs, profile of its subsidiaries, branches or details of shareholding, financials, projections, track record. profile of product, any data or information regarding either Parties employees, prospective employees, business objective / criteria, employee lists, employee profiles, employee information, and other documentation relating to past, present or future business activities and services, which is disclosed by the Party within thirty (30) days of the disclosure and which was designated as 'Confidential' or with a similar legend at the time of disclosure.

7. EFFECTIVE DATE AND DURATION OF MOU

- A. This MOU shall be effective from the date of its approval by competent authorities at both ends.
- B. The duration of the MOU shall be for a period of **one year** from the effective date.
- C. During its tenancy, the MOU may be extended or terminated by a prior notice of not less than six months by either party. However, termination of the MOU will not in any manner affect the interests of the students/faculty who have been admitted to pursue a programme under the MOU. Termination will totally prohibit any future study of research undertaken as a collaborative effort between the parties.
- D. Any clause or article of the MOU may be modified or amended by mutual agreement of Tooth Tickle and CMPN-VESIT.

8. IPR

Rights regarding publications, patents, royalty, ownership of software/design/product developed etc. under the scope of this MOU, shall be decided by the two parties by mutual consent.



9. CONFIDENTIALITY

During the tenure of the MOU both **Tooth Tickle** and **VESIT-CMPN** will maintain strict confidentiality and prevent disclosure of all the information and data exchanged under the scope of this MOU for any purpose other than in accordance with this MOU.

Further both **Tooth Tickle** and **VESIT-CMPN** shall put in place adequate and reasonable measures to keep and store confidential information securely so as to prevent any unauthorized and illegal use.

CONFIDENTIAL INFORMATION shall mean any proprietary information, data, patient data, patient's CBCT scan, or facts belonging to PARTIES collectively or severally, disclosed by the disclosing party under this agreement or any subsequent agreement, whether in writing, verbal or electronically, irrespective of the medium in which such information is stored, which is marked confidential or with any other words having similar meaning by the disclosing party, or specifically agreed to be kept confidential by the parties, or declared or identified so by the disclosing party before such disclosure or during the discussions.

- Either Party shall not mention or otherwise use the name or trademark of each other or its affiliates in any publication, press release, promotional material or other form of publicity without the prior written consent of the appropriate individual designated for the purpose by concern Party,
 - The receiving party shall take all steps as may be reasonably necessary to protect the integrity of the Confidential Information and to ensure against any unauthorized disclosure thereof.
 - Promptly inform the other of any potential or accidental disclosure of the Confidential Information and take all steps, together with the aggrieved Party, to retrieve and protect the said Confidential Information
- Use the Confidential Information only for the purpose for which it was provided and not profit from the same in any unauthorized manner to the exclusion of the disclosing Party.

10. All or any dispute arising between the parties in respect of this MoU of whatsoever nature shall be resolved under the laws of India and any or all such disputes will be subject to the exclusive jurisdiction of the courts of Mumbai, India and Thane, India.

11. This MoU is not intended to create any relationship in the nature of franchise, joint venture, or agency between the parties. Neither Parties shall act in a manner that expresses or implies a relationship other than that of independent contractors, nor bind the other Party. Either Party or any of its employees/ personnel shall not, under any circumstances, be deemed to have any employer-employee relationship with the other Party.

12. This MoU has been signed in duplicate, each of which shall be deemed to be an original.

Research supervisors from both the parties will be the corresponding authors in any publication resulting from the collaborative work. All the efforts put by the student/s as a part of this MoU will be accounted for by way of reporting the work in thesis and/or paper publication. This shall be subject to the requirements of clause 8 above.


Neither of the supervisors will publish the work carried out under this MoU without knowledge of the other.



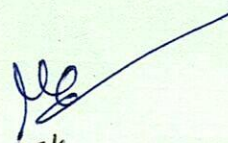
IN WITNESS WHEREOF, THE PARTIES HAVE EXECUTED THIS NON-EXCLUSIVE COLLABORATION AGREEMENT, AS OF THE DAY AND YEAR MENTIONED ABOVE, AND WILL FORM A PART OF THE CONTRACT.

SIGNED BY by the hand of its Authorized Signatory

Dr. Akshay Ranade
Founder,
Tooth Tickle Dental Clinic


4/11/22
DR. AKSHAY RANADE
MDS-ORAL MAXILLOFACIAL ONCOLOGIST
A-6444.
IMPLANTOLOGIST & AESTHETIC DENTIST
BOTOX, FILLERS & FACIAL REJUVENATION SPECIALIST
TOBACCO CESSATION SPECIALIST

SIGNED BY VESIT by the hand of its Authorized Signatory


Dr. J. M. Nair
Principal, VESIT
VIVEKANAND EDUCATION SOCIETY'S
INSTITUTE OF TECHNOLOGY
HASHU ADVANI MEMORIAL COMPLEX,
COLLECTOR'S COLONY, CHEMBUR,
MUMBAI-400 074, INDIA.



SIGNED BY Department of Computer Engineering, VESIT by the hand of its Authorized Signatory

Dr. Nupur Giri -
Professor and HOD, Department of Computer Engineering,
VESIT



Annexure A

Project Details - 2022-2023

Project :- Detection of the severity of temporomandibular joint dysfunction using machine learning

Student Names:

Shubhangi Zope (D17B/69)
Asmita Bhangare (D17B/10)
Hrithika Singh (D17B/57)
Rashmi Singh (D17B/58)

Mentor :- Dr.Sharmila Sengupta, Associate Professor, Dept.of Computer Engineering, VESIT

Signature:

Problem Statement (In accordance to MOU):-

The prevalence of temporomandibular joint and muscle disorder (TMJD) is between 5% and 12%. The temporomandibular disorders are most prevalent in the younger age population(18-35yrs). The project aims to make a TMJ disorder detection system using machine learning models. The problem statement is further divided into three segments:

- To detect the severity of TMJ disorder ranging from normal to severe based on the clinical data and image modality.
- To conduct evaluation measures based on precision accuracy and other evaluation parameters to achieve better results.

Proposed Solution(In accordance to MOU):-

To design a machine learning model which will predict the severity of temporomandibular joint dysfunction based on the patient's symptoms and the CBCT scan of their jaw joint.

- The major part of our project will be focused on the pre-processing of images and obtaining a clear boundary of bones in the CBCT scan.
- A model will be developed using both structured and unstructured data.
- We will be checking the accuracy of our model and will improve it on the basis of our evaluation measures to achieve better results overall.



Methodology / Block Diagram

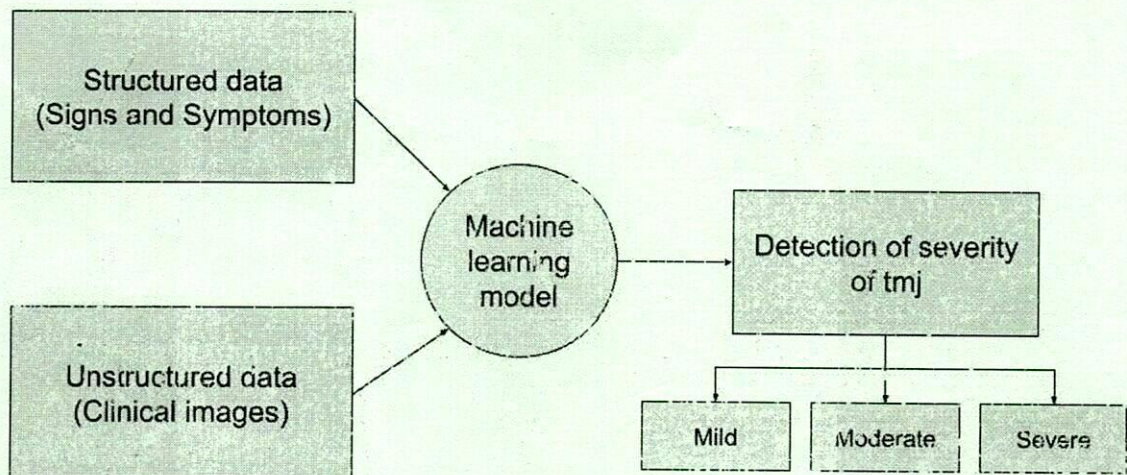


Fig 1:- Block Diagram Representation

To develop this project we will be using the vast scope of machine learning. The dataset provided will have various field values regarding symptoms, and CBCT scan. Using these fields we will implement machine learning algorithms for the prediction of TMJ disorder. These predictions will be able to precisely tell us about the grade of the jaw joints disorder of the patient..

