# logo and globo

# Expression of Interest

## Team Information

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| ***No.*** | ***Student Name*** | ***PGID*** | ***Mobile No.*** | ***CBA Email ID*** |
| 1 | Balaji Venkatesh | 11910041 | 9884294829 | balaji\_venktesh\_2019@cba.isb.edu |
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| 3 | Soumya Prasad Panigrahi | 11910088 | 9042406381 | soumya\_panigrahi\_2019@cba.isb.edu |
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## Project being applied for

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| **Project No.** | **Client Name** | **Title of the Project** |
| NA | Jan Elaaj Healthcare Private Limited | Digitise Doctors’ handwritten prescriptions using vision and deep learning techniques |

## 1. Problem/ sub-problem as the team have understood.

**Primary Models:**

* Build a “**Handwriting Text Recognition System**” specialized for doctor’s and to help decipher the words and arrange them to digital prescription. Ex: As shown below



* To identify medical related terms and categorize the text into one of the following segments : a) Vitals b) Past Illness c) Allergies d) Symptoms e) Tests g) Medicines/Dosage h) Diagnosis
* To develop a robust model with the use of Deep Learning Models embed with Computer Vision and Classical Machine Learning techniques with better accuracy.

**Metrics Evaluation Model:**

* Models needs to be trained specifically for every doctor over a couple of weeks to achieve the accuracy levels of 95% and above as part of the functionality

## Approach:

**Business Understanding:**

* Currently doctors are providing prescription through software application, which is cumbersome and takes more time for doctors to search each medicine making uncomforting or presciptions written by doctors in paper, where hospital needs a seperate person to undertand and take further actions which involves cost.
* Anything illegible or misinterpretations (even a word) will cause delays in treatment or serious outcomes etc..

**Data Understanding:**

* As we will get two types of data (basically Images) which are: IAM Handwritten Dataset for general training & 100 prescriptions per doctor for machine learning for 5 doctors which should be used for Personalized training, we will work on.
* If needed, we can collect further more presciptions of doctors for additional training

**Modeling:**

* Since we are dealing with Images and handwritten texts inside each images, we need to apply advanced techniques involving Deep Learning Model with Computer vision specialization.
* We will try to first pre process incoming images(converting to equal size and shapes), Smoothing the image etc.. before training
* Clearly we will use a Neural Network for our task. This consist of **Convolutional NN** (CNN) layers to process image and then followed by **Recurrent NN** ( RNN) layers to text processing and **LSTM** / final **Connectionist Temporal Classification** (CTC) layer for classification.
* We will try to build HOG (Histogram of Oriented Gradients) detector and any chance of improving model accuracy with this.

**Evaluation:**

* To ensure built model does not lead to overfitting, we will randomly sample three subsets of data: Training, Validation and test set.
* We will work with stakeholders to evaluate the model evaluation metrics to ensure the built model is acceptable and usable.

**Deployment:**

* We will work with internal stakeholders to provide recommendations on model deployment on internal data platforms

## 3. Why is your team the best suited to take up this project? (your competencies as a team, interests and prior experience if any)

Our team has taken “Deep Learning” course from ISB where we were get introduced with deep learning, CNN, RNN, LSTM etc… Also, we have done project in Facial Recognition project and trained models using above technologies as part of Assignment. Apart from this our team actively learning “Deep Learning for Computer Vision” high end course from **pyimagesearch.com** by Adrian Rosebrock, a pioneer in CV.

We are also aware of OpenCV, Keras framework. Also we have very good expose of using Python, machine learing models and training GPU’s in Google Collab.

Our team comprises of four people with two of the team members working for Cognizant, and three of the team members are located in Chennai which makes it easier to collobrate for this project.

Together as a team we are keen to work on growing technologies and bring a strong mixture of experience in analytical domain along with statistical and programming expertise with a combined experience of over 20 years.

**Team Details:**

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|  | **Balaji Venktesh** (currently Senior Associate at Cognizant) has over 7 years of experience in Data analytics and is highly experienced in handling a team, clearly identifying and defining problem statement and taking solution approach to the problem. |
|  | **Gireesh Sundaram** (currently Associate) has 5.5 years of experience working on Statistical Analysis and BI reporting tools using SAS and various other software packages, and approaches any problem with analytical mindset. |
|  | **Soumya Prasad** (Data Scientist at DMI Innovations) has 5 years of experience with a blend of Business Intelligence and Data Science. He has hands on experience on several machine learning applications across highly diversified domains. |
|  | **Vineet Kapoor** (Data Engineer at Genpact) has almost 3.5 years of experience in Data analytics, Data integration, python programming. His expertise lies in R & D and has worked in analytics/research related assignments for various clients like mass media and information firm of Canada, US financial services units. He has developed Data pipeline for financial data for media and information firm, to help the SFDC, ML and AI teams. He has exposure to various tools like python, Tableau(Desktop and Server), Salesforce,Excel,APIs. |