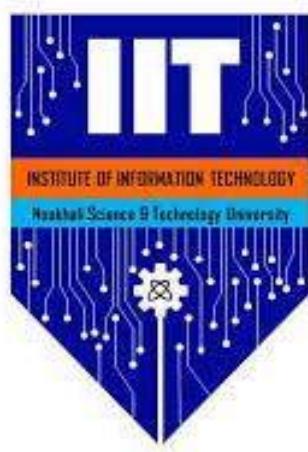


Bachelor of Science in Software Engineering
Institute of Information Technology, NSTU



Internship report
based on
Work Experience and Learning
at
Genuity Systems Ltd.

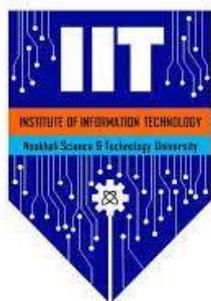
GENUITY  SYSTEMS



Institute of Information Technology, NSTU

Bachelor of Science in Software Engineering

Course Code: SE 4100



Internship Report

Submitted By

Md Mynuddin

ASH1825007M

Submitted To

Iftekharul Alam Efat

Intern Program Chair

Assistant Professor

Institute of Information Technology, NSTU

Performed at

Genuity Systems Ltd.

Plot-8, Road- 4, Block-A, Section-11, Mirpur, Dhaka- 1216, Bangladesh

GENUITY SYSTEMS

Internship Duration: 10 March 2022 - 10 September 2022

Date Of Submission: 23 October 2022



Letter of Transmittal

Iftekharul Alam Efat
Intern Program Chair
Assistant Professor
Institute of Information Technology, NSTU

Subject: Submission of internship report

Dear Sir,

I am glad to present you this internship report based on my experience and learning during my internship program at Genuity Systems Ltd. starting from 10 March 2022 to 10 September 2022. I am pleased to submit my internship report on "Genuity Systems Ltd." as per your instruction to fulfill the requirement of the SE 4100 course. While preparing this report, I have tried my level best to include all the relevant information, explanations, things I learned from the organization, and my contribution to the organization to make the report informative and comprehensive. It would not have been possible to complete this report without your assistance, for which I am very thankful. Working for six months at "Genuity Systems Ltd." was amazing and a huge learning opportunity for me. Also, it was a great experience to prepare this report and I will be available for any clarification if required.

Therefore, I pray and hope that you would be kind enough to accept my Internship Report and oblige thereby.

Sincerely yours

Md Mynuddin
ID: ASH1825007M
Institute of Information Technology, NSTU
Email: mynuddin2513@student.nstu.edu.bd

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Chapter 1: Introduction

1.1. Introduction

An internship is “any official or formal program to provide practical experience for beginners in an occupation or profession.” The most important element of internships is integrating classroom knowledge and theory with practical application and skills. It's an opportunity for students to work at an IT firm for a fixed, limited period to exercise their knowledge and get acquainted with industry practices. It offers students a period of practical experience in the industry relating to their field of study.

Experience gained through this internship program is valuable as it allows students to experience how their studies are applied in the real world, and as work experience, it can be highly attractive to potential employers on a candidate's CV. The internship provides students the opportunity to test their interest in a particular career before permanent commitments are made.

As a student of the Institute of Information Technology (IIT) of Noakhali Science and Technology University, I was very lucky to have a whole semester for doing my internship and I had the opportunity for gaining industrial experience. I was sent to Genuity Systems Ltd. to complete my internship. I joined Genuity Systems Ltd. as an intern on 10 march 2022. Actually, I love to write code in python and I chose the Data Science field. So, I wanted to complete my internship in this field to test real-world problems. And in the 7th semester, IIT offers a glorious opportunity to their students of having an internship within their bachelor program and I got the chance.

As expected, I was assigned to the “Machine Learning Team” software department of Genuity Systems Ltd. Dhaka Office. The expectations were high and now almost nearing the end of my internship I must admit that it was a really wonderful experience. There were many obstacles, and new technologies that I had to handle, so the journey wasn't simple. But after overcoming each challenge I discovered a new potential within myself. The skills that I have gathered are priceless to me. Moreover, after completing my internship program, now I am quite confident that I will establish my career as a Machine learning Engineer in the future.

1.2. Objective

The main goal of the internship is to develop a profound grasp of professional interactions, engage in activities, and interact with others in the workplace. This report's main goal is to give a general overview of Genuity Systems Ltd.'s internship program. This is a short description of my six-month internship as a compulsory component of the BSSE program.

At the beginning of the internship I formulated several learning goals, which I wanted to achieve:

- Gain experience
- Identify career goals
- Strengthen a resume
- Attain BSSE program credits
- Experience different work environments
- Develop new skill
- Job opportunities
- Networking
- Observe and learn ethics at work
- Leadership
- Taste the real-world problem to solve

1.3. Methodology

The overall report was created by examining my time spent working as an intern at Genuity Systems Ltd. The data used in this research was gathered from both primary and secondary sources.

❖ Primary Data

- Direct inspection through the internship time
- Conversation with employees
- Team meeting

❖ Secondary Data

- Genuity Systems Ltd. website
- Genuity Systems Ltd. LinkedIn profile
- Internet

1.4. Scope

Every student needs internship experience to put their classroom learning into practice and gain real-world experience from any organization. This internship experience will be useful for my future career. This report was created only for academic purposes and satisfies the internship affiliation requirement. Here, I go into more detail about my entire experience from the Genuity Systems Ltd. internship program. I made an effort to outline Genuity Systems Ltd.'s corporate structure and services. This study also includes information on the structure of team management and the method of working in a team. It also discusses how I adjust to the workplace. It primarily focuses on the actual projects I worked on and the many tools and technologies I employed. The mission and vision of Genuity Systems Ltd., management, partners, clients, company culture, technology, development methodology, my role and actions with the team, etc. were also shown and documented. I worked on this report with Mr. Iftekharul Alam Efat, an assistant professor at IIT, NSTU, as my supervisor.



Chapter 2: Company Profile

2.1. Company Name

Genuity Systems Ltd.

2.2. Registered Addressed

- Dallas, Texas Office
17106 Preston Bend Dr, Dallas
Texas, 75248, United States
(972) 248-2766
- Dhaka, Dhaka Office
Genuisys Point, Plot-8, Road -4, Block-A
Section - 11, Mirpur
Dhaka - 1216, Bangladesh
info@geuitysystems.com
sales@geuitysystems.com

2.3. Company Overview

Genuity Systems Ltd. is an IT company established in the year 2003 in Dhaka, Bangladesh. It has by now established itself as one of the prestigious entities providing IT and telecommunications-related services not only in Bangladesh but also in overseas countries.

The services offered by Genuity range from Contact Center solutions to VoIP soft-switch and billing solutions (for international markets), Mobile Dialer solutions to IVR and IP-PBX solutions, as well as professional IT training. We have established a sizable clientele both domestically and abroad in a short period of time. This was made possible by the quick turnaround and unwavering quality and dependability of our services, which are due to our highly qualified, competent, and motivated personnel. Before beginning a one-on-one relationship with a customer, we make an effort to get to know them and comprehend their needs. We often take on difficult projects, work on them with a lot of love as if they were works of art, and deliver the finished product to the delight of our esteemed clientele.

2.4. Mission and Vision

The goal of Genuity Systems is to offer the local community the most cutting-edge, comprehensive, and innovative communications, information technology, and software system solutions through a highly motivated, innovative, skilled, and experienced team of professionals, thereby enhancing the success of Genuity and the satisfaction of the markets and clients we serve.

Genuity's vision is to promote our products worldwide. Offers high-quality service to customers.

2.5. Valued Clients

 Southeast Bank Limited	 city bank making sense of money	 Southeast Bank Limited	 ONE Bank
 DHAKA BANK L I M I T E D	 Bank Alfalah	 Trust Bank A Bank for Financial Inclusion	 মার্কেন্টেইল ব্যাংক লিমিটেড Mercantile Bank Limited
	 IPDC FINANCE	 রবি 10 MINUTE SCHOOL	 LankaBangla FINANCE
 Community Bank • Trust • Security • Progress	 Mutual Trust Bank Ltd. you can bank on us	 MEGHNA BANK LTD.	 COMMERCIAL BANK
 Chaldal.com	 LankaBangla SECURITIES	 AMERICAN INTERNATIONAL UNIVERSITY PRAKASIDHAN BANGLADESH 1994	 BANGLADESH ARMY

Figure 1: Valued Clients

2.6. Products

2.6.1. gPlex Smart IVR

gPlex® Smart IVR allows users to enjoy quick, instantaneous service from the IVR. Unlike the traditional IVR, customers do not need to wait, listen to the entire IVR, or remember which IVR node is what. gPlex® Smart IVR is an internet-enabled service that does not require the customer to install any apps as long as the phone is equipped with internet capability with HTML5 compatible browser. Besides, its audio and visual representation enables customers to get quick service on the go and saves customers huge costs from the traditional IVR

Customer will call the call center (short code) and select Smart IVR service through DTMF. The call will be then disconnected and an SMS will be sent to the customer with a one-time link, upon clicking on that link customer will be able to use gPlex® Smart IVR service.

gPlex® Smart IVR request will come from smartphone into Smart IVR web. SIVR service will get the information from the database through DbLib, play the static announcement and get Instant Customer Endorsement (ICE), as well as pull the account-related service or any other

information via API from the City bank ecosystem to provide the dynamic service to the customers.

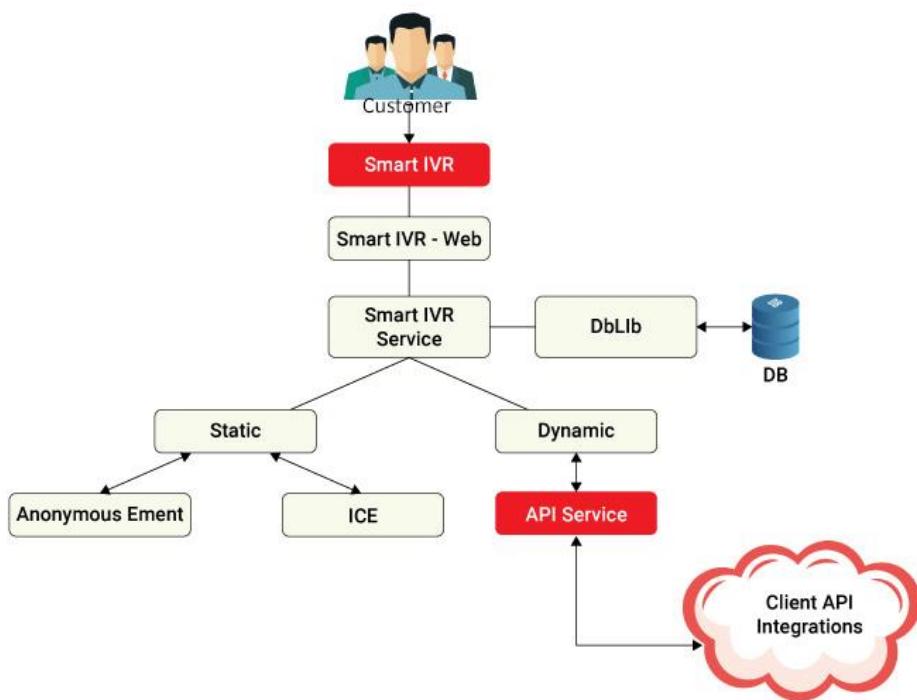


Figure 2: gPlex® - Smart IVR

2.6.1.1 gPlex® - Smart IVR Features

- Customer no need to remember the DTMF for the corresponding service node.
- gPlex SMART IVR is both compatible with smartphones and tablets as long the phone is capable of internet connectivity.
- Customer does not require to install any apps to enjoy the gPlex SMART IVR service.
- gPlex SMART IVR service is created with the concept of responsive design, which means that based on the customer's smartphone/tablet screen size all the menus will be aligned according to the screen aspect ratio.
- Customer can easily view or get service from gPlex SMART IVR through backend integration with the client ecosystem via API.
- In gPlex SMART IVR with the help of a news bulletin feature company management can broadcast short messages to all live customers who are using SMART IVR services.

- gPlex SMART IVR also support small forms where customer can directly submit forms to the company. E.g. For internet banking service customers will no longer need to go to the bank, rather through gPlex SMART IVR can submit the form directly to the bank.
- gPlex SMART IVR also can also be integrated with the gPlex OTP module for additional security during financial transactions.
- Seamless integration with existing IVR.
- Better routing, fewer zero-outs, and fewer calls.
- gPlex SMART IVR has both audio and visual representation of the IVR nodes, along with backward and forward of the IVR nodes and an option to enable or disable sound.
- Management can enjoy rich reporting of customer interaction. For example Service Report, Service Summary, Interactive Customer Endorsement Report, SMART IVR Menu & Service Hit Count.
- Since, gPlex SMART IVR is an internet-driven service gPlex recommends deploying the solution under the DMZ zone.
- Most user-friendly experience compared with the traditional IVR.

2.6.2. Call Blaster

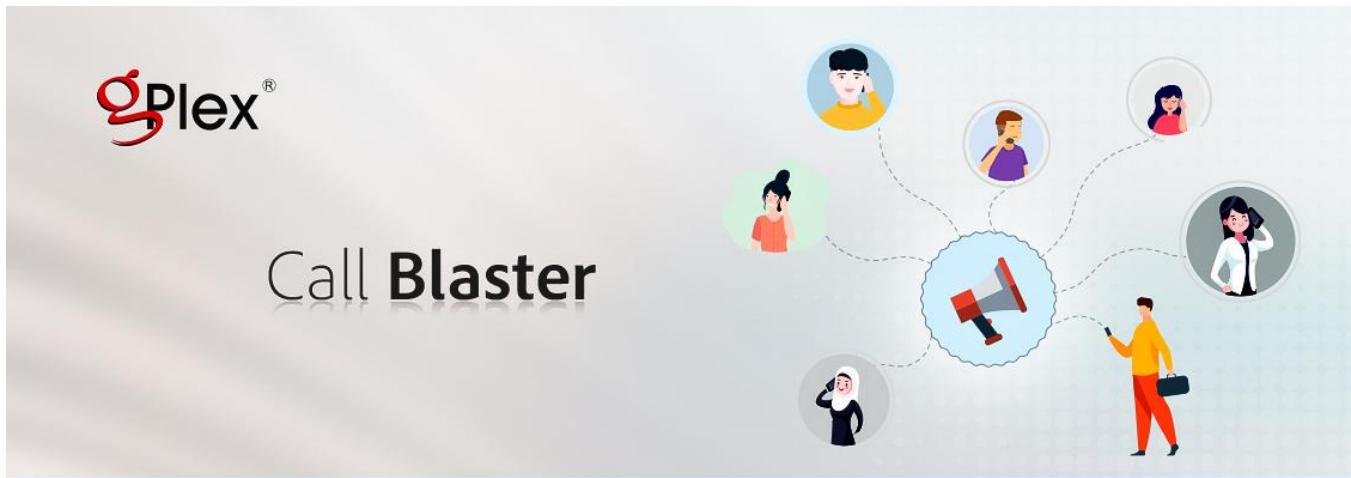


Figure 3: Call Blaster

gPlex® Call Blaster is a highly scalable automatic over-the-phone message broadcasting system. It can dial millions of numbers in a matter of hours. It can manage multiple campaigns simultaneously. Its management tool allows the setting of media changes, minimum and

maximum ports, control of Calls per Second (CPS), and much more. The system comes with a real-time dashboard and rich reporting features including the provision of customized reports. The gPlex® Call Blaster is an independent system that can be deployed either as a stand-alone system or as part of a 'Contact Center System'.

2.6.2.1 Reach Millions in Hours

With the help of the gPlex® Call Blaster system, firms may communicate with numerous contacts at once to convey pertinent information while operating under a single campaign. An application program interface (API) that is incorporated into the backend ecosystem can be used to deploy a built-in interactive voice record (IVR) system to collect customer feedback or carry out commercial operations. We work hard to give our business clients high-quality service encounters so they can pass those along to their clients.

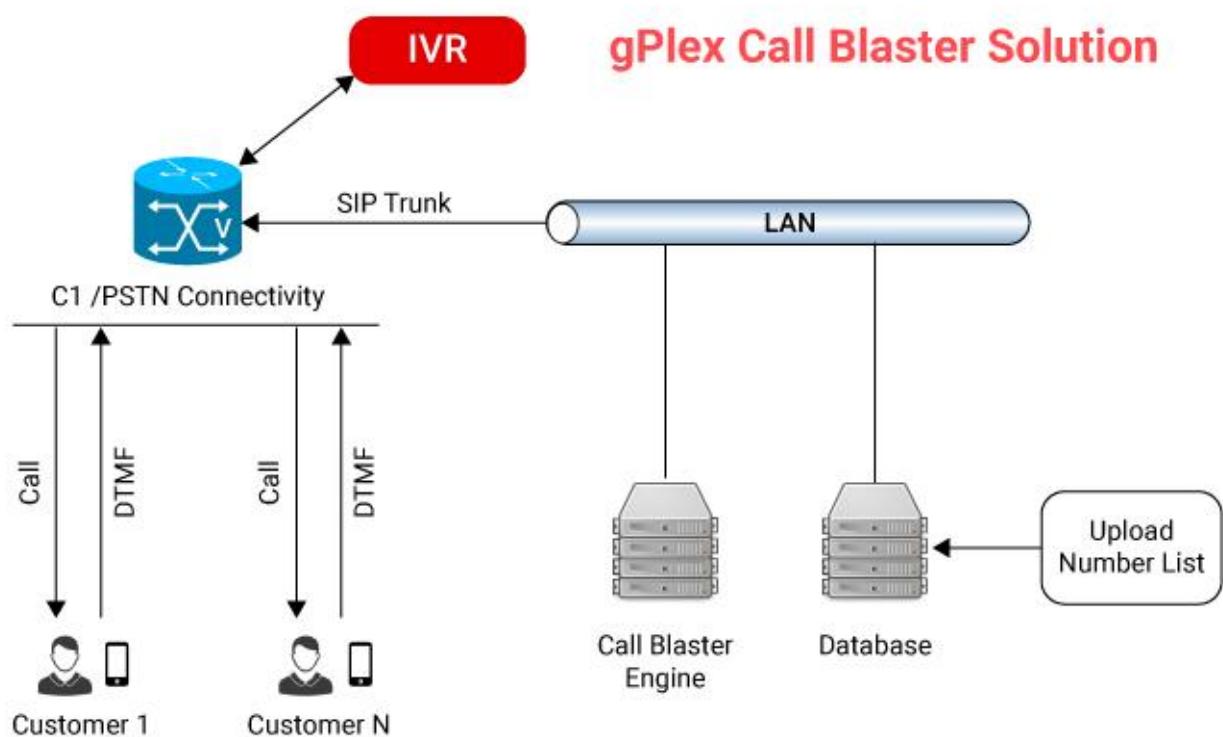


Figure 4: gPlex® Call Blaster Solution

2.6.2.2 Benefits of gPlex® Call Blaster

- Reach millions of customers in hours.
- Run several campaigns simultaneously.
- Real-time dashboard for call statistics and sales count.
- Built-in IVR to obtain customer feedback.
- Can perform business processes through API integration.
- API-Interface to pull contact information from third-party CRM.
- Can upload millions of contact information in Excel, CSV, text format, etc.
- Automatic Language selection.
- Support STM-1/E1/SIP trunking.
- Stand-alone solution scalable to 2000 ports/channels per campaign.
- Zero capex and low opex.
- Service available through hosted platforms under the pay-as-you-go model.

2.6.2.3. How gPlex Call Blaster do for your Business promotion?

With gPlex® Call Blaster, you can call millions of customers with a customized voice message for getting feedback, promote your new product or service, inform them about your upcoming event, and much more! It's a web-based automatic outbound dialing solution that scrolls through your existing phone contacts and sends out your pre-recorded message. Whether it's updating your target group on the latest special offer or letting them know about a new product, gPlex® Call Blaster services can help you do it faster and more comprehensively than ever before.

Special Promotion:

Businesses often introduce time-sensitive special promotional offers. The challenge is such offers must be communicated to a very large number of target customers within a short time window, say reaching out to millions within a couple of days. Creative call campaigns executed by gPlex® Call Blaster service may be the ideal solution to handle such situations efficiently. Integrated APIs may be deployed to automatically subscribe and deliver certain service products to previously registered customers. Examples of use: (i) Travel Agents promoting special occasion/event price discounts, (ii) Home improvement companies offering special discounts on specific items like flooring/carpeting for a limited period.

Customer Feedback:

As a customer satisfaction exercise businesses often need to obtain customer feedback following the delivery of their services. gPlex® Call Bluster service may be used to have those customers automatically called during a user-defined time window to obtain customer feedback on services they received. Example of use: (i) Car/AC/Heater repair shops seeking feedback from their customers who visited them recently.

Emergency Messaging:

Cities, Schools, and Businesses often need to send out emergency messages to their constituents/customers within a very short window. gPlex® Call Bluster service can offer a very effective and appropriate solution to handle such situations. Example of use: (i) School districts sending out school closure notice to all students/staff due to impending snow storm, (ii) Cities sending our flash flood warning-related calls to their citizens.

2.6.3. Mobile Banking Apps

Mobile Banking is a service provided by a bank or other financial institution that allows its customers to conduct financial transactions remotely using a mobile device such as a smartphone or tablet. gPlex® mobile apps come in handy for enterprise customers and allow access to customized services.



Figure 5: Mobile Banking Apps

2.6.3.1. gPlex® Mobile Banking App Features

Check the balance of your accounts	Mobile Top-up	View Summary of Credit Cards
View past transactions	Change TPIN (Banking PIN)	Pay your credit card and bill
Account overview	Email to Customer Contact Centre	View past billed statements
Transfer funds	Call to Customer Contact Centre	View unbilled transaction
Fund Transfer between own accounts	Set profile picture to personalize app	Balance transfer
Request for account statement	Frequently asked questions (FAQs)	Apply for a loan on credit
Schedule Fund Transfer	Locate nearby branches and ATMs	Report Lost / Damaged Card
View Scheduled Payments	Locate discount partners outlets	Regenerate Credit Card PIN
Bill / Utility Pay	Message/News board	E-statement of your Credit Card

2.6.4. Advanced IT Training

2.6.4.1. Go to a Professional be a Professional!

Genuity Training is a technical career house providing hands-on, intensive training to develop the technical skills they need for a successful career as an Information Technology (IT) Professional. Genuity Training offers a broad range of IT training courses and programs which ensures a very specific training package for all skilled IT Professionals.

Why Genuity Training

- Expert trainers
- Various programming courses
- A well-furnished and attractive labs
- Committed to providing quality services

Genuity takes great care in selecting highly experienced professional instructors, cross-trained in several technologies. They can relate the strengths and weaknesses of the products and present alternative solution strategies when they are warranted.

For details about Genuity Training, please visit www.genuitytraining.com

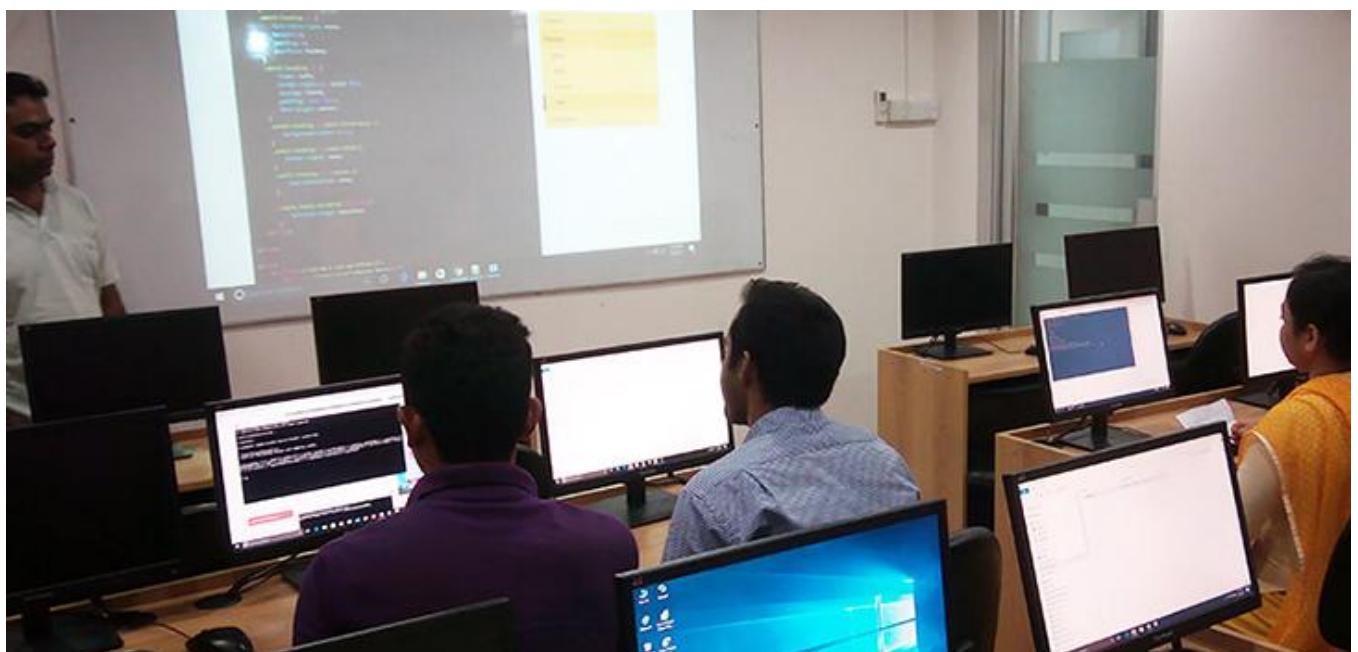


Figure 6: Genuity Training

2.7. Solution

2.7.1. Contact center solution



Figure 7: Contact Center Solution

2.7.1.1. gPlex® - Enhancing Customer Experience!

The gPlex® Contact Center solution is likely the most feature-rich, cost-effective, simple to set up, dependable, and highly scalable system, regardless of whether you need a cloud-based or on-premises contact center solution. No issue if you want your agents spread out geographically. The gPlex® Dashboard enables real-time, glance-based monitoring of contact center activity. Increased productivity and customer satisfaction are facilitated by swift realization. The gPlex® contact center solution generates various, highly useful reports and charts that help your contact center run smoothly. The gPlex® contact center solution is scalable and simple to deploy. While the core server is located at the central office, agents can be put remotely at various places.

2.7.1.2. gPlex® Contact Center Feature

Multi-channel ACD	API for Telebanking	PCI-DSS compliant
Flexible IVR	Voice logger	Webchat
Smart IVR (Visual IVR)	Screen logger	Chatbot

Blaster IVR / Agentless IVR	Find last Agent	MoH with Filler
Multi-location call route	Dashboard	Social Media integration
Caller priority	Wallboard	SMS/TEXT integration
Screen popup	Predictive dialler	Email and Ticketing
Integrated CRM	Unified agent desktop	TTS, STT, ASR
Mobile App for Supervisor	Unified Reporting	Work Force Management

gPlex® Contact Center Solution is suitable for any size of contact center business. Efficient agent desktop softphone and one-touch keyboard functionality facilitate easy navigation and increased performance. It will improve efficiency through reduced manpower costs and increases overall profitability.

For more details about gPlex® Contact Center solution please visit www.gplex.com

2.7.2. Smart PBX Solution

2.7.2.1. Smart Business Phone Solution

gTalk® PBX provides a complete suite of business communications services suiting individual business needs at affordable costs. gTalk® PBX features include auto-attendant, call queue, conference calling, do-not-disturb, and much more. It offers companies with multiple locations the ability to operate under one umbrella, allowing increased productivity and reduced resource requirements. Now your employees can work from home, or any location globally with our easy-to-use, plug-and-play gTalk® PBX solution.

Auto Attendant	Web-based portal	Call park
Music on hold	Call forwarding	Call monitoring
Called ID & name	Call return	Ring Groups
Call waiting	Mobile App	IVR
Call Hold	The Last number redial	Voice mail

Call transfer	Do not disturb (DND)	BLF (Busy Lamp Field)
Call pick-up	Find me/Follow me	Page / Announcement (PA)
Personalized greetings	3-way conference	Conference-Bridge
Missed call indicator	Speed dial	Voice Recording
Call history	Simultaneous ring	Advance call routing

gTalk® PBX service is flexible enough to connect multi-location businesses under a single PBX platform, scale up and add users instantly. The solution is highly scalable. You can increase or add extension/capacity as your business grows without having to worry installation of new equipment.

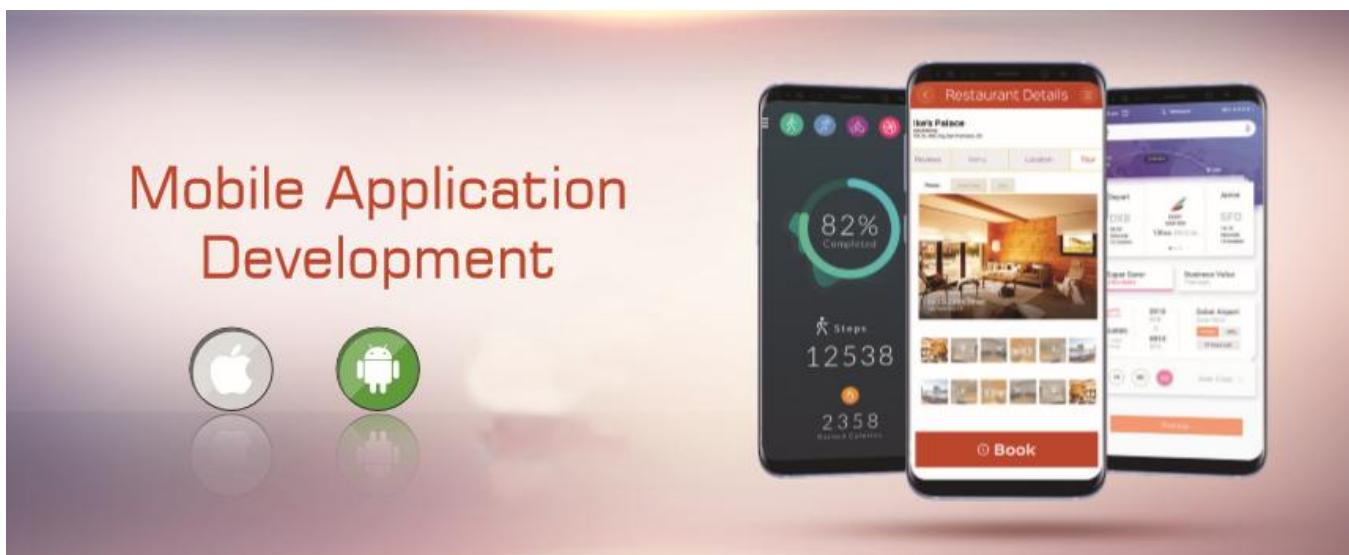


Figure 8: Smart Business Phone Solution

INNOVATIVE CUSTOM MOBILE APPLICATION DEVELOPMENT

Our vision is to help businesses in enhancing and project their image and boost performance through the development and maintenance of innovative aesthetically designed and user-friendly Smart Mobile apps.

2.7.3.1. Types of Application:

- Business apps
- Finance and Banking apps
- Health care apps
- E-commerce apps
- Telecom apps
- News & Magazines apps
- Voice related apps
- Entertainment apps

2.8. BPO Services

2.8.1. Call Center Services



Figure 9: Call Center Services

Genuity BPO offers best-in-class call center services, both inbound & outbound, to clients from different industries such as banking and financial, healthcare, insurance, manufacturing, travel and hospitality, automotive, energy utilities, logistics, retail and consumer, telecommunication, and others. We provide 24 X 7 call center solutions to stay connected with your clients and customers to provide business solutions around the clock.

We provide affordable but quality and technologically powered (gPlex) call center services to startups, and medium and large size companies. We are one of the trusted enterprise call center solution providers in Bangladesh and the USA Service industry with advanced technology like Self-Service, Mobile Dashboard, Multilevel IVR, Smart IVR (VIVR), Phonetic Recognition, CIVR, Intelligent Routing, etc. Our skilled and dedicated professionals provide exceptional information or technical support service to customers.

2.8.1.1. Contact Center Service

- Inbound Call Center
- Outbound Call Center
- Tele Marketing/ Tele Sales
- Chat Support Services
- Email Support Services
- Customer Care Services

2.8.2. Why Choose Genuity BPO as Call Center Outsourcing Services Partner?

Assure High Quality of Services

Genuity BPO promises to adhere to the highest standards of quality services. Our quality assurance team keenly observes & regulates that all the call center operations are performed up to the specified standards. Our industry experts are on hand to ensure the deliverables.

Enhanced Customer Satisfaction

Being a leading call center solution provider, we offer a variety of customer engagement channels to be outsourced such as phone, email, live chat, social media, etc. to allow you to reach an extensive section of customers quickly that in turn, resulting in increased customer satisfaction & retention.

Make Use of Analysis

Our all-inclusive Analytics provide crucial insights related to the performance of your brand & its market value which facilitates a complete understanding of the product, to the consumer.



Right analytics and data help in more profitability and enhance customer service. Work with Best-in-Class Technology

Our entire contact center outsourcing services are performed through the latest technologies, which can be successfully incorporated with Customer Relationship Management tools with advanced technology like Self-Service, Mobile Dashboard, Multilevel IVR, Smart IVR, Phonetic Recognition, etc. Our outsourced call center solutions help businesses provide technology-enabled global call center services.

Regular Training to the Team

In order to maintain the perfect communication skills & make the employees keep updated about the industry knowledge, we provide regular training & development of our call center outsourcing services staff.

Email Response & Help Desk

We are a global call center services provider & ensure that our customers get incessant support. We provide a pertinent & constant customer service experience with a single point of contact & instantly respond to customer questions during the sales process.

2.9. Company Hierarchy

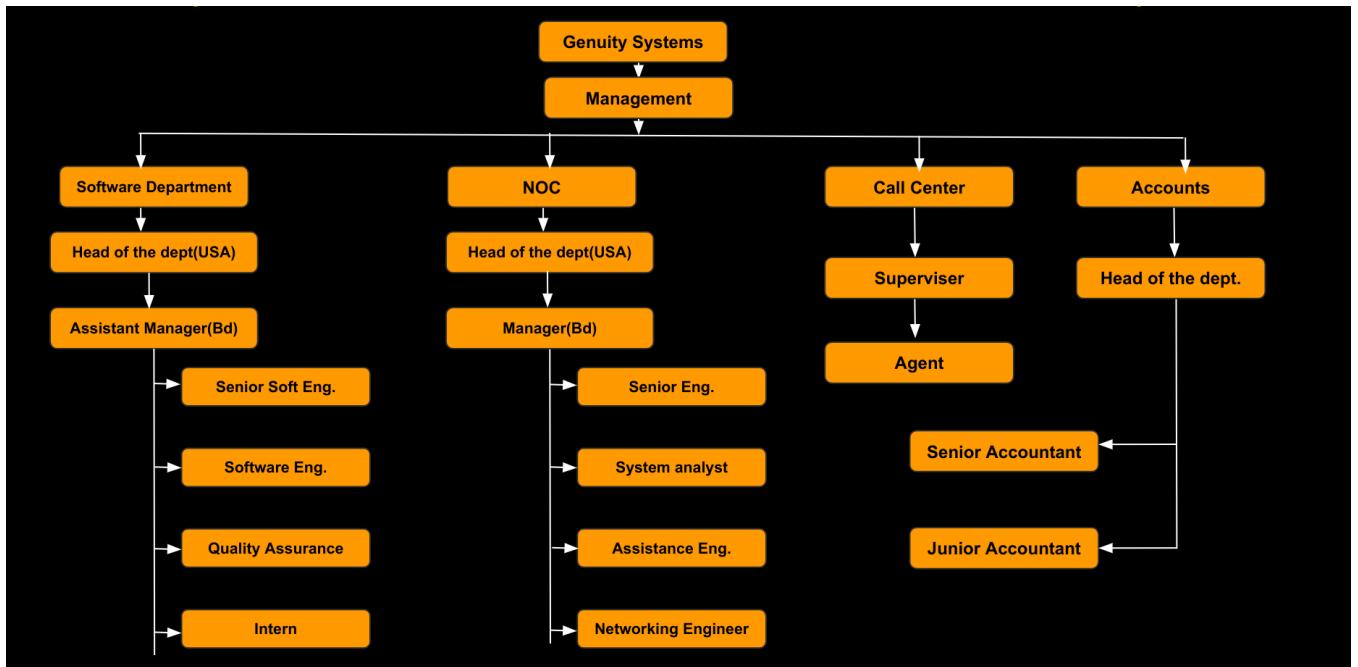


Figure 10: Company Hierarchy

2.10. Office Culture and Environment

2.10.1. Overview

Manpower is one of the most important resources of any organization. The performance and success of an organization depend on the employee of the company. Therefore providing a healthy and friendly environment in addition to a professional setup is very important. Genuity believes that in the journey employee should stay fit both physically and mentally while absolutely loving what they do. Hence, Genuity provides all the facilities that are needed for the refreshment of employees while doing their creative jobs.

2.10.2. Friendly Working Environment

Genuity has a great working environment in the office space, totally custom designed for a software development company. From color selection to furniture orientation it has been very careful to create an environment that actively enhances the knowledge exchange and collaborative nature of work.

I have spent 6 months as an intern at Genuity. All the members did not differentiate us from other employees. All the members are very friendly. They help us to adapt to new changes and challenges. And this friendly environment helps us to refresh our minds while working for hours.

2.11.3. People

Genuity doesn't hire developers, designers, or QA engineers, it hires people who can solve problems. And it hires only the best. It runs regular training and review sessions to keep employees on top. And its culture of constructive criticism, learning, and sharing expands our horizons and keeps employees level-headed.

2.11.4. Beware of the Meeting

Awareness about the meeting has become a habit of the employees of Genuity Systems Ltd. Because they believe that a meeting is the only arsenal that can draw attention as well as helps to communicate project progress, clarifies product direction, and identifies any issues or impediments. Although not everyone speaks at these meetings, every team member is present in the meeting. Besides this, a meeting is essential to make sure that the project is almost always moving forward. Being present every day keeps everyone accountable and prepared for that day. It allows for the project's focus to be better dictated.

2.11.5. Self Responsibility

The meaning of responsibility is "response-ability" - the ability to choose one response. Genuity employees are highly proactive people who recognize their responsibility. They do not blame circumstances, conditions, or conditioning for their behavior. Their behavior is a product of their own conscious choice, based on values, rather than a product of their conditions, based on feelings. To achieve major success in life -one must assume 100% responsibility for his/her life. Nothing less will do. In every moment, the employee believes that the outcome will produce based on the event and response. The Event + Our Response = Outcome

2.11.6 Keep the workplace Comfortable

There is no doubt that the workplace's physical and social environments are key factors in whether employees are satisfied or dissatisfied. With so much attention focused on trimming

costs to hold down prices, many companies find themselves struggling to define what's essential and what's extravagant. A comfortable workplace does not lead to leaving the company, missing work unnecessarily, and having less conflict in the workplace. Orion ensures their workplace is healthy and comfortable to work in, good lighting, comfortable desks, and chairs, comfortable office decor, a quiet environment, and a kitchen with a fridge where they can store food bought from the market, all make the workplace more inviting for employees. Temperature is the most common office complaint among workers, Genuity ensures air conditioning (AC) for each and every room which proves that the work environment has the right temperature for the employees to work in.

2.11.7. Being Humble

Humble begets success for life or a company. We're living in an era where many leaders are put on a pedestal. CEOs are conveyed as all-powerful celebrities. Everyone should humble oneself. Besides that culture, Genuity exhibits some other cultures. Two of the best predictors of performance — both academic and on-the-job — are intelligence and conscientiousness, and humility predicted performance better than both.

2.11.8. An honest approach to business and trust in each other

In a normal sense says that brand perfection is necessary before the brand of honesty strategy which leads to the biggest misconception. Successful teamwork is built on a foundation of trust. Each member of the team must establish trust, cultivate trust through his/her actions, and words, and work to maintain it. Each member also needs to be able to trust his/her team members to make a commitment to the team and its goals, work competently with those goals in mind, and communicate consistently about any issues that affect the team.

2.11.9. Dress Code

There is no specific dress code in Genuity. Most of the employee comes with casual dress up. But no one is allowed to reach the office with unusual dress up.

2.11.10. Special Day Celebration



Figure 11: Birthday Celebration of Abdullah Vai (Middle)



Figure 12: Eid celebration



Figure 13: Genuity 19th anniversary celebration



Figure 14: Farewell of an employee



Figure 15: Pohela Boishakh Celebration



Figure 16: Blessing us to be married in pohela boishakh celebration



Figure 17: Food provided from the office in Pohela Boishakh Celebration



Figure 18: Machine Learning Team in Pohela Boishakh



Figure 19: Iftar Party



Figure 20: Journey Begins with IFIC Bank



Figure 21: Table Tennis Championship



Figure 22: Annual Picnic

2.11. Office Schedule

Office starts at 9:00 am and ends at 6:00 pm, from Sunday to Thursday. There is a 1.00-hour break from 12.01 pm for lunch and prayers and 15 min break for tea..

2.12. Facilities for Employees

According to the two-factor theory of job satisfaction, salary is just a hygiene factor. Motivation factors are important for high productivity. Genuity Systems Ltd. has several facilities for the employees.

2.12.1. Domestic Environment

Genuity is like one big family. All the current and ex-employees are members of this Genuity family. Work is fun here. Employees consider the company to be their own responsibility.

2.12.2. Lunch and snacks

The employees are provided with lunch from the office. Weekly 5 days they provide different tastes of food and unlimited tea. And also every department randomly chooses a food manager from the employees for 1 month. Office Provide the manager 5 thousand taka for all employees of the department and he expenses the money for them. So the manager tries to provide snacks all time like biscuits, Chanachur, Coffee, Chips, Seasonal Fruits, and sometimes ice cream

2.12.3. Comfortable Sitting Arrangement

As developers work for hours sitting on the same chair and looking at their desktops, Genuity provides comfortable chairs which are adjustable to their height and arms.

2.12.4 Dinning and Prayer Room

Dining room and the prayer room are located on the 3rd floor of the office.

2.12.5. Games

Actually in Genuity Systems Ltd. there are only Table tennis Games Facilities.



Chapter 3: Internship Details

3.1 Joining Letter

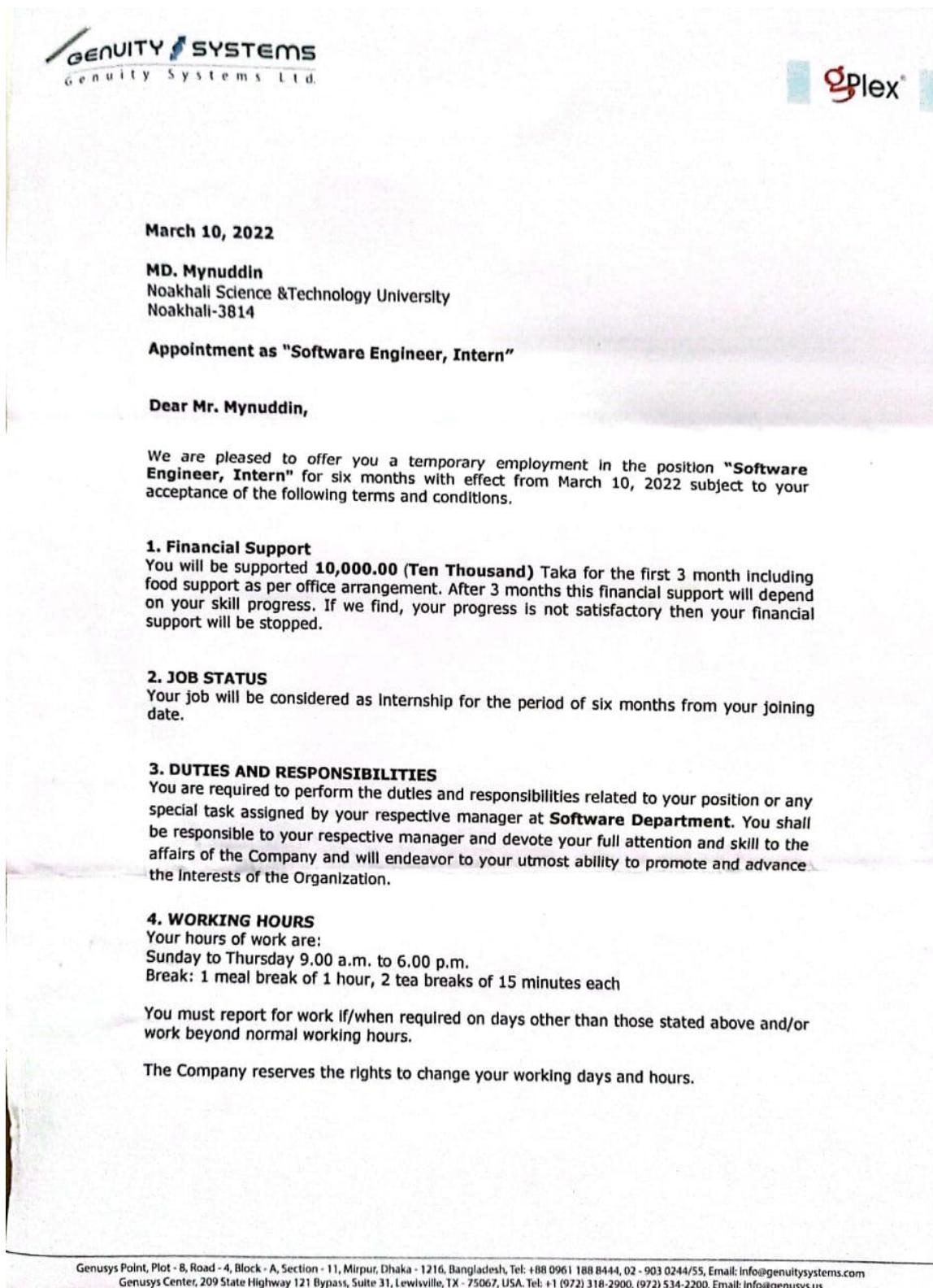


Figure 23: Joining Letter

GENUITY SYSTEMS
Genuity Systems Ltd.

Gplex*

5. ANNUAL LEAVE/HOLIDAYS
In internship period there is no formal annual leave permission except emergency which will be considered as leave without pay.

6. RULES REGULATIONS & CONFIDENTIALITY
As an employee of Genuity you will have to follow all policies and guidelines of Genuity regarding employment and service.

Accordingly, you will undertake that:

- i) You will under no circumstances make available your services (whether for payment or otherwise part-time or otherwise) to any undertaking, or have any interest directly or indirectly in any other undertaking or activity which might interfere with the proper performance of your duties without first obtaining the written permission of the Company;
- ii) You will not at any time during the continuance or after the termination of your services with the Company irrespective of any reason for such termination, make use or disclose to any party either for your own benefit or for the benefit of any individual, firm, company, any trade or business, the affairs and confidential information of the Company or any of its related companies of which you have been informed or become aware during the period of your service with the Company;
- iii) You will obey and comply with all orders and instructions given to you by the Company or its authorised person and observe all standing and other rules and/or regulations now in force or from time to time lay down by the Company.

7. TERMINATION
In case of valid reason, for internship employee, notice of termination of employment will be subjected to fifteen (15) days' notice in writing from either party. Notwithstanding the aforementioned, the Company shall be entitled to terminate your employment without notice, indemnities and compensation in any of the following events:

- i) If you shall in the opinion of the Company be guilty of dishonesty, misconduct or negligence in the performance of your duties;
- ii) If you have after showing cause in writing been found to have committed any serious breach or continual material breach of any of your duties or obligations under this appointment;
- iii) If you are found to have made illegal monetary profit or received any gratuities or other rewards (whether in cash or kind) out of any of the Company's affairs or any of its related companies.

Genusys Point, Plot - 8, Road - 4, Block - A, Section - 11, Mirpur, Dhaka - 1216, Bangladesh, Tel: +88 0961 188 8444, 02 - 903 0244/55, Email: info@genuitysystems.com
Genusys Center, 209 State Highway 121 Bypass, Suite 31, Lewisville, TX - 75067, USA. Tel: +1 (972) 318-2900, (972) 534-2200, Email: info@genusys.us

Figure 24: Joining Letter

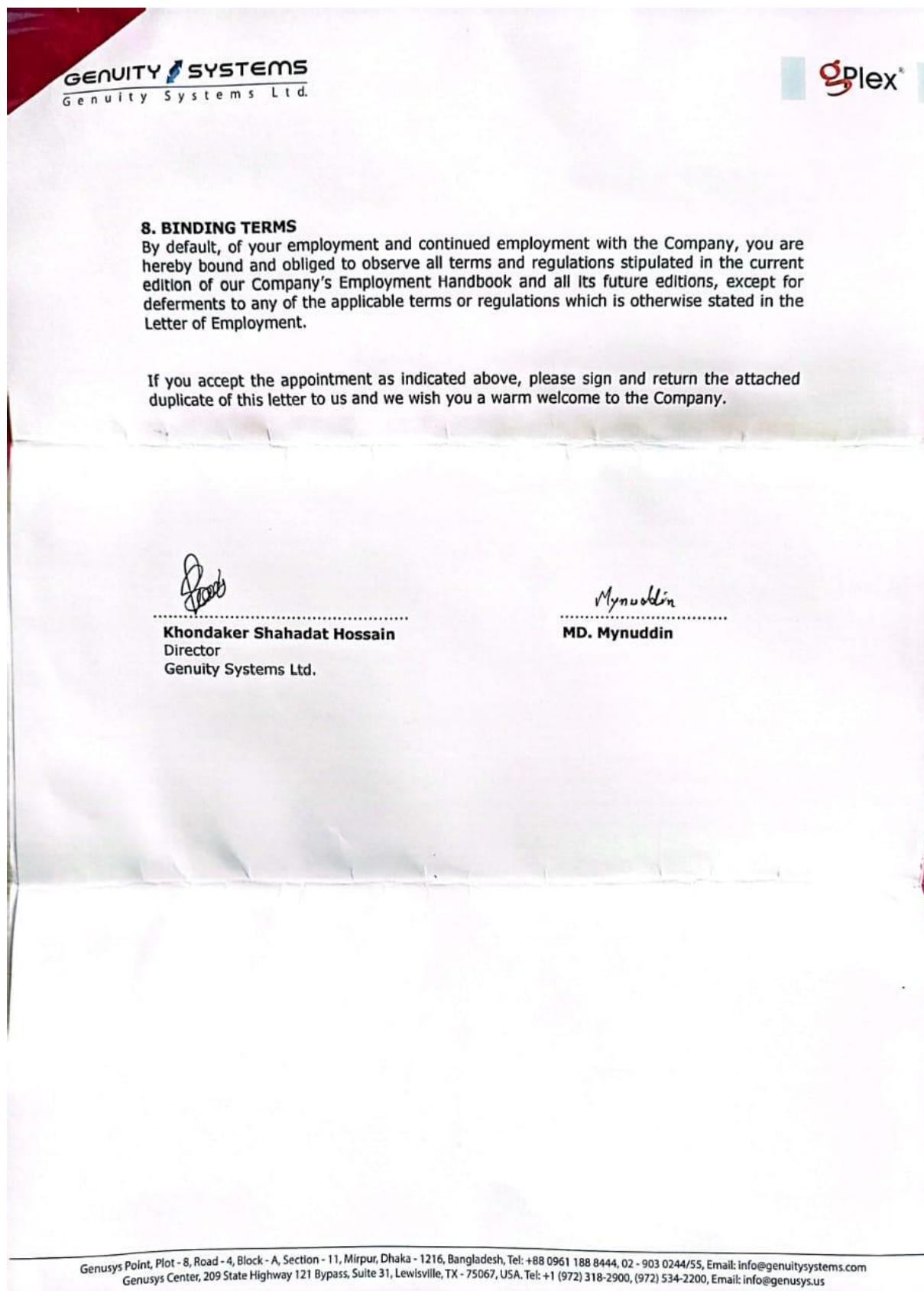


Figure 25: Joining Letter

3.2. Assigned Team

Working Team

Machine Learning Team	
Name	Responsibility
Team Leader	Nafees Mahbub Software Engineer Genuity Systems Ltd.
Team member	Emrul Hasan Zawad Software Engineer Genuity Systems Ltd.
Team member	Rifat Hasan Software Engineer Genuity Systems Ltd.
Team member	Azizul Hakim Software Engineer Genuity Systems Ltd.
Team member	Md Mynuddin Software Engineer Trainee Genuity Systems Ltd.

3.3. First day at office

When I got my joining date, I was extremely glad, yet as the date came closer, I was somewhat apprehensive. Numerous inquiries involved my cerebrum like in what manner will be the air of the workplace, will I have the capacity to modify with the associates, will I have the capacity to function admirably and completer targets, and so on. I came in at about 9:00 am on the first day and my boss welcomed me warmly and introduced me to my team, Managing Director,

and other employees. He showed me where my desk was and told me that he and my team leader would help me get started. He was very helpful and I sat next to him for the morning and just watched what he did. At lunch, my boss and the staff of the office invited me to lunch. I was so nervous; I could hardly eat a thing! We were gone for about 1-1.5 hours and just talked about the company, my studies, etc. After lunch, my team leader took me on a tour of our floor. Introduced me to everyone, showed prayer place, and all that good stuff, and me where the kitchen was, how the coffee machine worked, and where the copy machine was. I had some time to myself to figure out the new computer system and just look around. My day ended at 6.00 pm. It was a great first day.

3.4. Technical Skill I learn

As I join the Machine learning team and if I wanna work on a real-life project I need to achieve many skills. So my team leader provides me with the necessary resources and I follow his instruction. Below I mentioned the list of my learning topics.

3.4.1. Python

- Basic python
- Data Structure
- File handling
- Function
- Module
- Array and String
- Working with Image
- OOP Concept
- Special Variable
- Advanced Function
- Comprehension
- Numpy
- Pandas
- Exploratory Data Analysis(EDA)

3.4.2. Statistics

Basics Stats	Intermediate Stats	Advanced Stats
Introduction to basic terms	Standard Normal Distribution ***	Q-Q plot
Variables	Z score ***	Chebyshev's inequality
Random Variables	Probability Density Function ***	Discrete And Continuous Distribution
Population, Sample,Population Mean	Cumulative distribution function	Bernoulli And Binomial Distribution
Sample Mean	Hypothesis Testing ***	Log Normal Distribution ***
Population Distribution, Sample Distribution and Sampling Distribution	Many different plotting graphs	Power Law Distribution
Mean, Median,Mode , Range	Kernel Density Estimation	Box-Cox Transform
Measure Of Dispersion	Central Limit Theorem ***	Poisson Distribution
Variance	Skewness of Data	Application Of Non Gaussian Distribution ***
Standard Deviation	Covariance ***	
Gaussian/Normal Distribution ***	Pearson Correlation Coefficient ***	
	Spearman Rank Correlation Coefficient ***	
	Importance of Correlation ***	
	All Hypothesis Testing ***	
	R-Squared vs. Adjusted R-Squared: What's the Difference?	

3.4.3. Data Visualization

- Matplotlib
- Seaborn

3.4.4 Machine Learning

3.4.4.1 Data Preprocessing

- EDA
- Feature Engineering
- Feature Selection
- Feature Transformation
- Dimensionality Reduction
- Handle Imbalance Dataset
- Cross Validation
- Correlation
- Multicollinearity

3.4.4.2 Supervised Machine learning

- Linear Regression for single variable
- Linear Regression for Multiple variable
- Polynomial Regression
- Ridge and Lasso Regression
- Logistic Regression
- SVM(Support vector machine)
- Decision Tree
- Naive Bayes
- KNN(K-Nearest Neighbour)
- Ensemble Technique
 - Bagging
 - Random Forest

- Boosting
 - Gradient Boosting
 - XGBoosting
 - AdaBoosting

3.4.4.3 Unsupervised Machine Learning

- Clustering
 - Hierarchical Clustering
 - K-means Clustering
 - DBSCAN

I study all these algorithms in-depth theory with implementation and create a report. Here is a sample of a report.

Problem statement: Emotion Detection for Bangla dataset.

Dataset description: we need to detect the emotion of the text, is it normal text or angry text? In this dataset, there are two feature

- 1.text_bangla : bangla text
- 2.audio_emotion : emotion of the text .(A-Angry text , N-Normal text)

text_bangla	audio_emotion
এজেন্ট আউটলেটে গিয়েছিলেন	A
আচ্ছা ম্যাম আপনি তো অফারটি সম্পর্কে জানতে চাইছিলেন আমি চেক করে দেখে আপনাকে জানিয়ে দিচ্ছি ম্যাম কিছুটা	A
এখান থেকে আমরা আপনার কোনো বাইক লোন দেখতে পাচ্ছি না এই ফোন নাস্বারের অ্যাগেইন্সটে এই ফোন নাস্বারের অ্যাগেইন্সটে	A

আপনাদের মিসটিকের কারণে হ ইজ নাউ আনফরচুনেট আমি আমার দুর্ভাগ্য এটা	A
স্যার আপনাকে তো অথরাইজ নাম্বার থেকে কল করতে হবে আদারওয়াইজ তো আমরা এখন থেকে	A
স্যার বর্তমানে আমি আমাদের ইন্ড থেকে দেখতে পাচ্ছি আপনার নাম্বারটিতে	N
স্টার জিরো হ্যাশ ডায়াল করে কঙ্গো বাল্ডেল থেকে সেখানে থেকে নিতে পারবেন	N
আজ্ঞা স্যার বুবতে পেরেছি স্যার এ রকম কোনো কল এখন থেকে রিসিভ করবেন না তাহলে অসুবিধাগুলো হবে না আপনার	N
একটু সময় দিন আপনার এরিয়াতে নেটওয়ার্কজনিত কোনো সমস্যা আছে কিনা সেটি চেক করে আপনাকে জানাচ্ছি ঠিক আছে	N
ধন্যবাদ স্যার আপনার মূল্যবান সময় দিয়ে আমাকে সহযোগিতা করার জন্য	N

Solution : Here I need to build a model, where users provide input and the model detects the emotion of the text.like,

Input : আমার সিম এ এতো বেশি টাকা কাটে কেন?

Output : Angry

Input : স্টার এইট ত্রিপল ফোর হ্যাঁশ

Output : Normal

I apply different algorithms and try to find the best one which provides me the best output.

Here is the report for each algorithm.

1. Naive Bayes Algorithm

Classification Report

	precision	recall	f1-score	support
0	0.57	0.77	0.65	22
1	0.75	0.54	0.63	28
accuracy			0.64	50
macro avg	0.66	0.65	0.64	50
weight avg	0.67	0.64	0.64	50

Confusion Matrix

TP = 17	FP = 5
FN = 13	TN = 15

Accuracy : 64.0%

2. K-Nearest Neighbour

Classification Report

	precision	recall	f1-score	support
0	0.54	0.86	0.67	22
1	0.80	0.43	0.56	28
accuracy			0.62	50
macro avg	0.67	0.65	0.61	50
weight avg	0.69	0.62	0.61	50

Confusion Matrix

TP = 19	FP = 3
FN = 16	TN = 12

Accuracy : 62.0%

Using hyperparameter tuning (for K-neighbour = 1)

3.1.SVM(using default parameter)

Classification Report

	precision	recall	f1-score	support
0	0.54	0.86	0.67	22
1	0.80	0.43	0.56	28
accuracy			0.62	50
macro avg	0.67	0.65	0.61	50
weight avg	0.69	0.62	0.61	50

Confusion Matrix

TP = 19	FP = 3
FN = 16	TN = 12

Accuracy: 62.0%

3.4.5. Audio signal processing for machine learning

- Overview of Audio Signal Processing
- Sound and waveforms
- Intensity, Loudness and Timbre
- Understand Audio Signal
- Types of Audio Features
- How to Extract Audio Feature
- Time Domain Feature
- Fourier Transform
- Defining the Fourier Transform using Complex numbers
- Discrete Fourier Transform
- Short Time Fourier Transform
- Mel Spectrograms
- MFCCs

3.4.6. Bash Script

- How to build bash script
- Variable and shell expansion
- How to bash process Command line
- Request user input
- Logic
- Processing options and Reading files
- Array and for loops
- Debugging
- Scheduling and Automation
- Working on remote servers

3.4.7. Neural Networks

- Perceptron (Single layer Neural Network)
- Multilayer Neural Network

❖ Forward Propagation

❖ Backward Propagation

➢ ANN - Artificial Neural Network

➢ RNN - Recurrent Neural Network

➢ CNN - Convolutional Neural Network

❖ Activation Function

 → Sigmoid

 → ReLU

 → Leaky ReLU

 → ELU

 → Swish

 → Softmax

 → Softplus

❖ Optimizer

 → Gradient Descent

 → Stochastic Gradient Descent

 → SGD with momentum

 → Adagrade

 → Adadelta and RMSProp

 → Adam

- ❖ Loss Function
 - Probabilistic Loss / Classification Loss
 - ◆ Binary Cross Entropy
 - ◆ Categorical Cross Entropy
 - ◆ Sparse Categorical Cross Entropy
 - Regression Loss
 - ◆ Mean Squared Error
 - ◆ Mean Absolute Error
 - ◆ Huber Loss
- ❖ Library: Mainly Keras, TensorFlow, Scikit-learn.

3.4.8. OpenCV

- How to Read, Write, and Show Images in OpenCV
- How to Read, Write, and Show Videos from Camera
- Draw geometric shapes on images
- String Camera Parameters
- Show Date and Time on Videos
- Handle Mouse Event
- Cv.split_merge_resize_add_addWeighted
- Bitwise Operations(AND, OR, NOT)
- How to Bind Trackbar
- Object Detection and Object Tracking Using HVS Color Space
- Simple Image Enhancement
- Matplotlib with OpenCV
- Morphological Transformations
- Smoothing Images |Blurring Images
- Image Gradients and Edge Detection
- Image Pyramids
- Image Blending
- Find and Draw Contours
- Motion Detection and Tracking Using Opencv Contours
- Detect Simple Geometric Shapes
- Image Histograms

- Template matching
- Hough Line Transform
- Road Lane Line Detection
- Haar Cascade Classifiers
- Detect Corners
- Background Subtraction
- Resource
- Warp Perspective
- K_Face and Eye Detection From Videos
- K_HAAR cascades Classifier
- K_Pedestrain Detection
- Basic Image Manipulation
- Image Annotation
- Image Enhancement
- HDR
- Panorama
- Face detection
- Edge Detection

3.5. Assigned Project

Actually I was not assigned to any projects. There is a project “Face Recognition” who is responsible for this project he left the job without completing this. The team leader assigned me to this project.

3.5.1 Face Recognition

A facial recognition system is a technology capable of matching a human face from a digital image or a video frame against a database of faces, typically employed to authenticate users through ID verification services, and works by pinpointing and measuring facial features from a given image.

The team leader has given me the task that the system “recognizes multi-face with good FPS”.

3.5.1.1 Project Screen Shoot

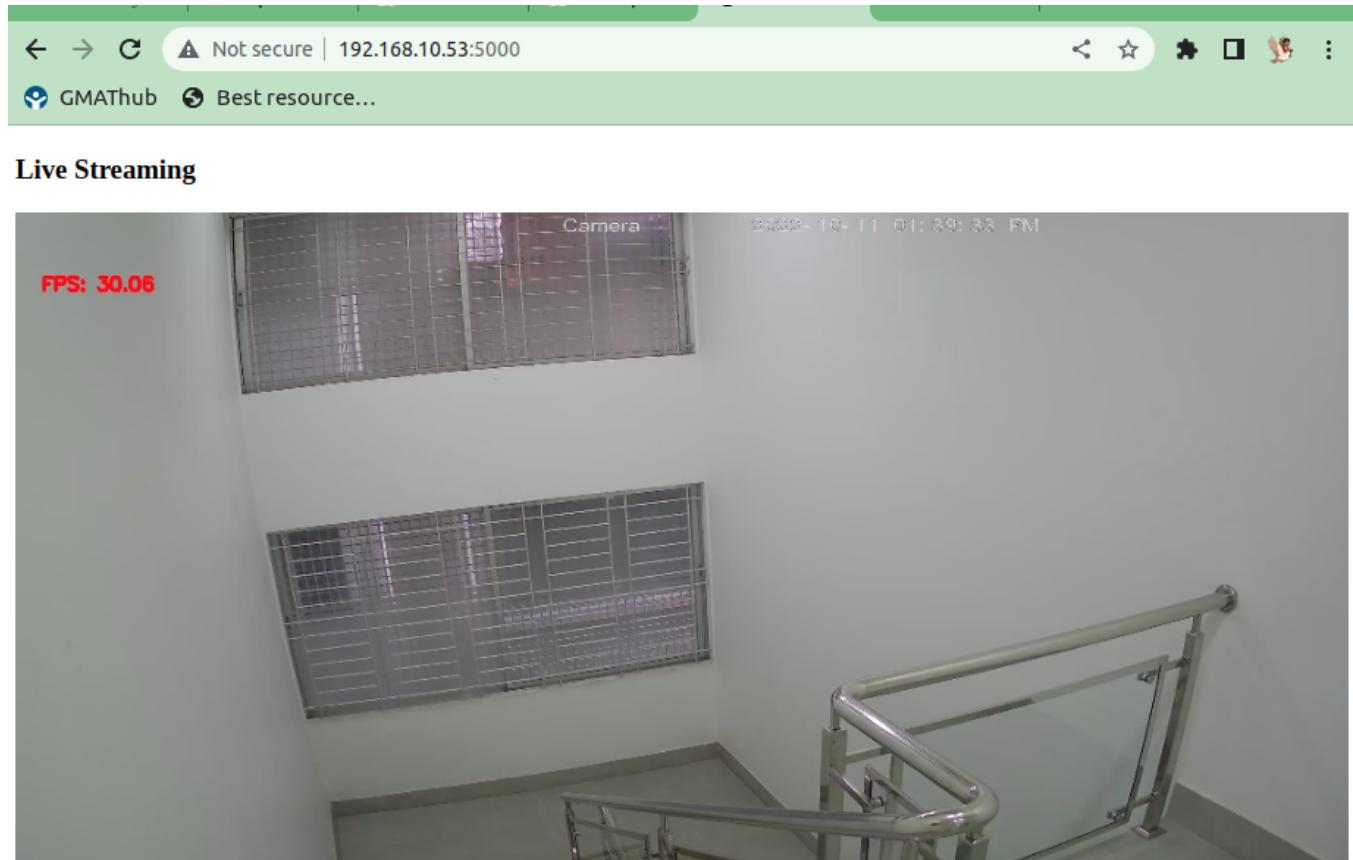


Figure 26: Office camera for face recognition

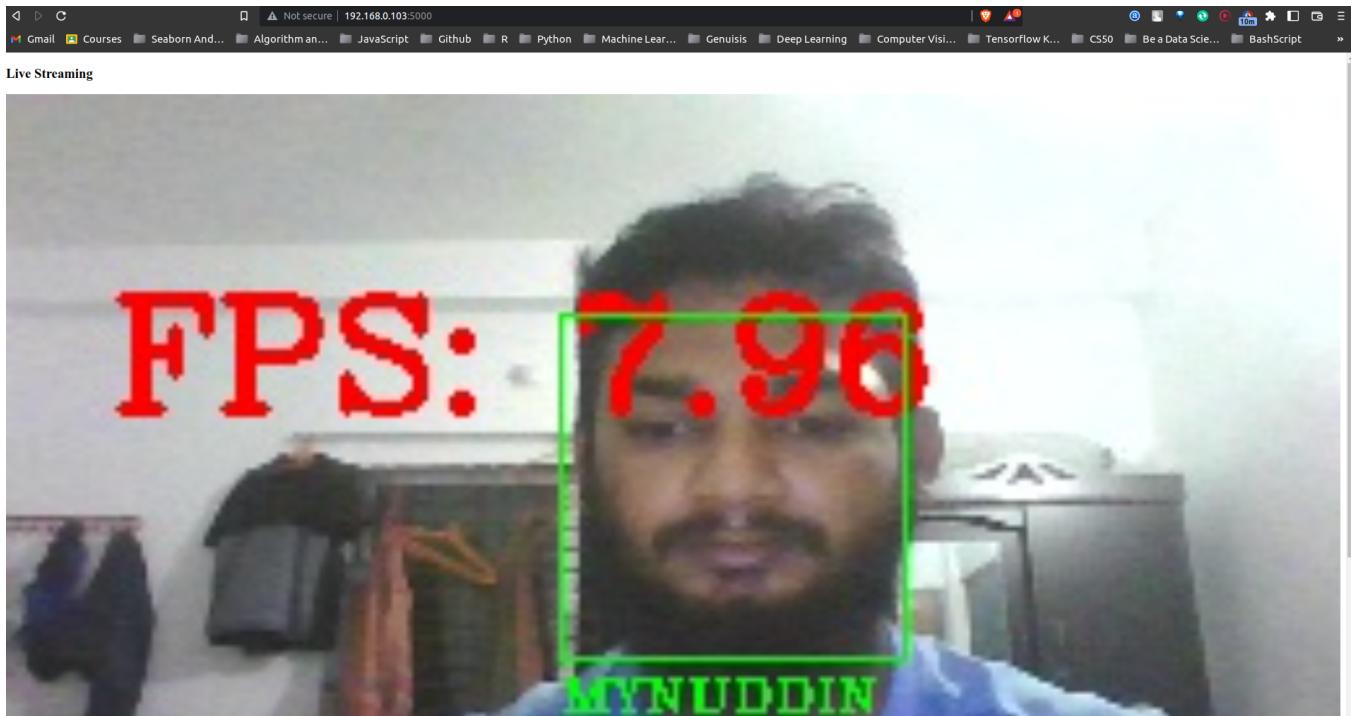


Figure 27: Face recognition for single face

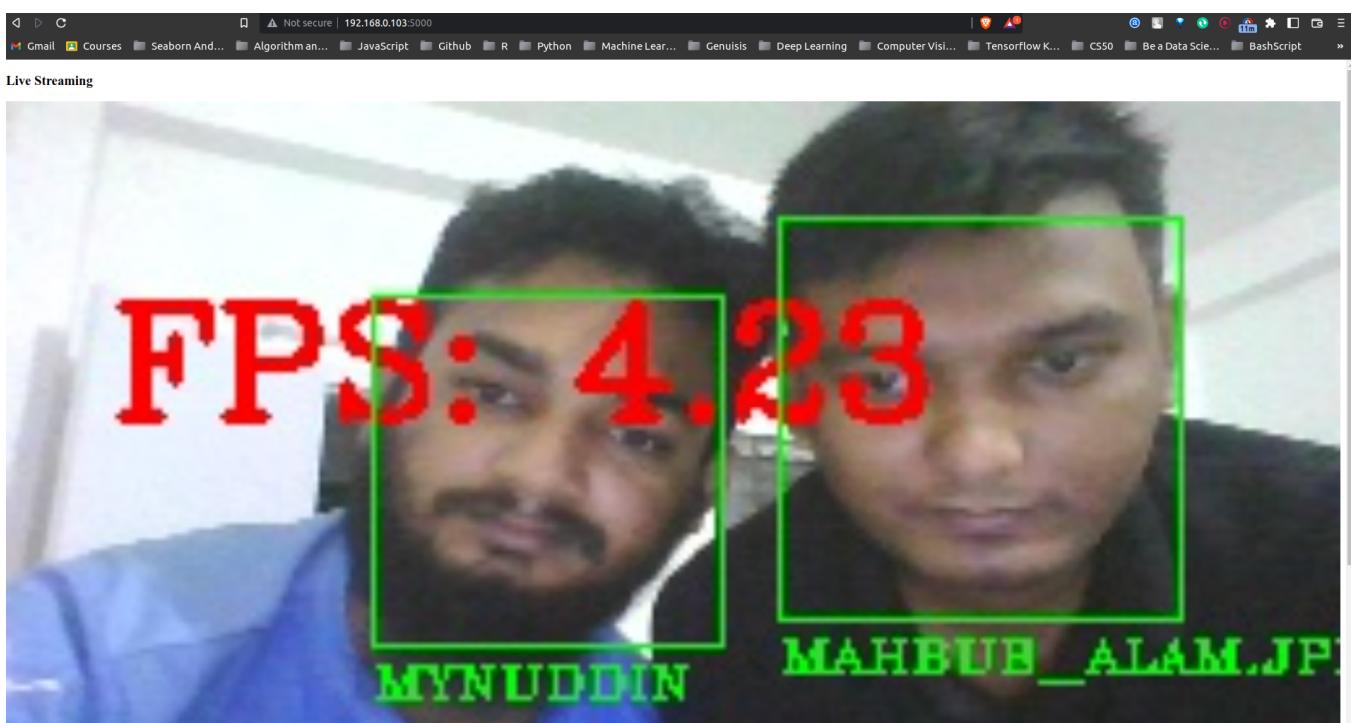


Figure 28: Face recognition for multi-face

As far as I complete every task given by my team leader, I also completed this task on time.

3.5.1.2 Tools and Technology I used

- Python
- Dlib
- Mediapipe
- Face recognition
- Flask
- VideoStream
- CV2
- Visual Studio Code

Last few days of my internship team leader introduced to me Kaldi ASR (Automated Speech Recognition) for speech to text and Coqui TTS for text to speech.

3.7. Technical or skill-based lacking and challenges

- Working with Bangla dataset
- OpenCV
- Linear Algebra
- Neural Network
- Statistic
- Probability
- Calculus



Chapter 4: Self Assessment

4.1. Punctuality

Punctuality is the act of completing something on time, coming to work on time, and meeting deadlines. It shows that I respect other people's time and am willing to be organized. It's an essential skill in both personal and professional settings. Being punctual shows that a person is reliable, organized, and respects other people's time. In order to meet the company's requirements, employees are expected to be punctual.

In Genuity Systems Ltd. office starts at 9.00 AM and closed at 6.00 PM. I was always punctual. I enter the office on time. There is an Employee Management System that traces everything about the employee. If an employee enters the office before 9.15 AM EMS shows you a green signal. I always maintained the company rules. Meeting deadlines is an important punctuality skill because it shows that I am organized and can manage my time well. I always meet deadlines. When I meet deadlines, it shows that I am reliable and can be trusted to do work on time. And also I was always respecting other's time and trying to be Organized because it helps me keep track of my time, tasks, and resources.

4.2. Attitude

Throughout my whole journey as an intern, I was always enthusiastic to learn something new. At first, I was also a little bit afraid of the new environment of the company. But, within a short period of time, I made myself accustomed to it. Although it is always difficult and challenging to learn new things I think that I was able to cope with these challenges. My rational, hard-working, and passionate attitude and my supervisor's guidelines helped me to deal with the new corporate culture, office environment, and new technology. I hope that this attitude will help me to handle any critical situation easily in the days coming.

4.3. Ability to learn

Changes can make humans either immortal or ordinary. In my case, there occurred a radical change in me too. Somehow, I have got the power of learning to work exceptionally well.

Genuity made me introduced to this. At Genuity, I have got very nice and friendly mentors and supervisors who taught me really well. Actually, I never meet anyone like some of my team members and my mentors. They were never annoyed to answer even my stupid questions. And at the same time, I could catch everything that they have been telling me. So, I would say, I learned at Genuity really well and I would like to thank my teammates for that. Hence, in my opinion, Genuity is a good place to learn and I have made the best out of it.

4.4. Dependability

The word "Dependability itself bears a lot of gravity. Sometimes it is seen that many companies do not want to involve their interns in their main and core projects. They think that it is too much risky and also time-consuming for them to involve interns because interns come for only three to six months and after that, they will go eventually. In my company, I as well as my other co-intern members initial hard-working convinced our manager very positively. I also hope that this dependable attitude will result in a long-term bridge between IIT and Genuity SystemsLtd.

4.5. Initiative

Initiative is one of the most essential characteristics of any employee. In a company, everybody works in a group and in each group every person has his own responsibilities. There is no culture to push anybody to do their responsibilities. Genuity was like a family. Whenever I have done any work, I tried to do it with my full efforts. When I faced any problem I tried to solve it myself and proceed well on my own. I hope that this sort of attitude of mine will help me in the long run.

4.6. Quality of Work

Every company's reputation depends on its products' quality and product quality depends on the quality of work and their doers. So in every project quality must be considered one of the highest priority features. And that's why there are no compromises allowed in the qualities of employees even.

I always tried to maintain my best quality in these projects. There were given lots of training to us for our quality improvement. I have followed standard documentation, structured coding development, and formal reporting according to every day's task list. I maintained project planning and project timeline for completing my project properly. Hence, I always tried to maintain the highest quality of work throughout my internship at Genuity Systems Ltd.

4.7. Relations with Others

The best thing about Genuity is its cordial and cooperative employees who will make your stay a lively and fruitful one. Whenever I faced any problem, I frankly discussed it with my colleagues. They tried to help me at their best. In our free time, we would share everything about ourselves like a family. In our company, every employee's birthday party used to be celebrated with a birthday party cake. It was really good to work with experienced and talented people. Moreover, I had a very close relationship with all my colleagues which helped me to be among myself in their weal and woe.

4.8. Maturity-poise

Though at the beginning I had more confidence in myself, gradually it turned into a sheer one. Working on some real-time big projects helped me quite mature poise and confidence. Involvement in these projects also taught me how to handle and cope up with big projects, how to manage everything easily, and how to maintain project timelines and schedules. My maturity and poise also helped my manager to easily involve me in such critical projects. Hence, I am quite confident and poised nowadays and hope to maintain that throughout my whole life.

4.9. Judgment

Judgment is a mature term to refer to. It is not generated within a day or in a month. It is the quality that builds up gradually with the gathering experience. It helps to take appropriate decisions at the appropriate times which will be helpful for any company to maintain its commitment to clients. As I was involved in a project, I tried to develop my skill on judgment. In

this phase I tried my best to follow the standard way of coding, maintaining the timeline, and planning of doing things at the right time. All these helped me to grow the judgment quality inside me with time and experience.

4.10. Initiative

In a company everybody works in a group and in each group every person has his own responsibilities. I tried to complete all my tasks with my own responsibility, and if I had any problems, then I can go for any type of help needed for that task to the team members. Or even I had completed my work before the given time limitation, with my own responsibility I have done another task. Actually, my works were defined there. It was known to me, that what I have to do on daily basis, and if there were any work that I didn't know, my supervisor assigned that to me. Working in the Machine learning team has made me more responsible as the quality of the product is totally dependent on the team and it made me able to take initiative for the upcoming tasks.

4.11. Teamwork

Teamwork is the collaborative effort of a group to achieve a common goal or to complete a task in the most effective and efficient way. This concept is seen within the greater framework of a team, which is a group of interdependent individuals who work together towards a common goal. The four key characteristics of a team include a shared goal, interdependence, boundedness and stability, the ability to manage their own work and internal process, and operate in a bigger social system. The basic requirements for effective teamwork are an adequate team size.

In Genuity after meeting with clients team leader assigned the task to the developer and every team member needed to update their task on a daily basis. I am also one of them. Every week there is a team meeting where everyone explains what they do, what the problem is with this task everything. If there is a problem and one of the team members can't solve this then the whole team tries to solve the problem. When I face a problem first I try to solve it by myself. If can't solve it then I knock my supervisor or other team members. Above all, before I join Genuity Systems Ltd. I actually don't know how actually a team should work. What was the

benefit when I worked with the team below I mention the point?

- Improve Developer Skills
- Increase code quality
- Boosts Productivity
- Creativity and Innovation
- Retrospectives Continuously Elevate Efficiency
- Increase Business Potential
- Morale and cohesion keep teams together longer
- Creative idea
- Improve problem-solving skill

4.12. Overall Progress

The six months internship period, has given me a lot of experience and knowledge. With these experiences, I can build my career more successfully in the future. Working on a Machine Learning team has made my analytical mind stronger. Now I am pretty much sure that, I have the capability to work with real-life problems. Involvement in these projects also taught me how to manage everything easily, how to maintain tasks timeline and schedules, and how to develop a system. The journey at Genuity Systems Ltd. made me more hardworking, passionate, punctual, responsible, and confident.



Chapter 5: Conclusion

I learned valuable information about the software industry, its culture, working conditions, and all about software development thanks to the internship program. Participating in daily and weekly team meetings with the team leader and other team members and talking about the challenges of the projects gave me the confidence to cultivate a never-give-up mentality. In addition, it motivated me to work hard, be accountable, and be self-assured while teaching me about the software life cycle used in the software industry. The thing I want and cherish the most is an inspiration. They constantly gave me the motivation and tools I needed to learn new skills and adapt to them. They also gave me advice on what to study and how to approach the learning process.

The internship program has increased my teamwork capabilities as well as my respect for the team mate's ideas and suggestions. Team discussions like brainstorming sessions helped me identify and solve numerous problem issues which would have been impossible to solve otherwise.

I would like to convey my thanks to IIT, NSTU for providing me with an opportunity to gain an idea of the competitive environment in the professional field. It has certainly lifted my software development skills in terms of planning, designing, coding, and deployment. I now look forward to facing the upcoming challenges of the world.

Chapter 6: References

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