18DCO301J - DATA X – APPLIED DATA SCIENCE WITH VENTURE
APPLICATION

Detection of Human Presence

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Team Members

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1. *Introduction*

Our project aims to track the number of people present at a place and can be used in stores, restaurants, malls, etc. to get data on how many visitors enter a store and at what time. To know how many visitors actually become customers.

1.1 Need of the Project

- All institutions, workplaces and businesses can use our project to get data on how many visitors enter, leave the store and at what time.
- Social distancing is the need of the hour in the Covid-19 pandemic. Our project also helps prevent overcrowding.
- This can be done by keeping track of the number of people in a given space at any given point of time.
- It is also applicable in educational institutes and hospitals to keep track of people entering and leaving for attendance and record purpose.

1.2 Approach

- We use python & openCV code which uses an optical flow tracker to track the person when one enters/leaves the room.

- Libraries used: cv2, numpy, matplotlib.pyplot and datetime.

1.3 Benefit

- Reduces cost of operation as it is autonomous, so human error and costs are eliminated.
- Our project helps implement COVID-19 norms at public places by preventing overcrowding , by keeping a count of people present there at a given time.
- It is financially viable as it only needs a camera and a computer.
- Helps businesses better understand customer patterns and target sales accordingly.

1.4 Competition

- V-count
- Our USP - financially viable and has a wider range of applications.

2.*Customer Validation*

Persona

Rajeev Singh: Owns an electronics store at a local mall.

Pains:
> 1. Not able to keep track of customers at store, at given point of time 2. Difficulty in getting insights due to lack of data and following covid guidelines.

Gains:
> 1. Get data on how many users enter
> 2. To ensure social distancing is maintained in the store and preventovercrowding.

Jobs to be done:
> 1.   They try to keep track of how many users enter store and at whattime.
> 2.   This data is important as they can observe how many visitors endup purchasing products. This data can help them strategize and plan sales & offers.

Reality
> 1. They assign an employee to do this task.
> 2. It is more expensive and data is often inaccurate.

Problem Validation

1. Can you tell me more about the last time you did tried to gather data on visitor count?
   "Yes,It was expensive and excruciating and data was inaccurate as the employee made a mistake."

2. What are the reasons you would like to keep a track of number of visitors?
   "To understand sales patterns, target offers and increase sales, prevent overcrowding and promote social distancing"

3. How often do you experience this issue?
   "About 70 times a year, especially during festive seasons."

4. What are you trying to achieve/get done by gathering this information?
   "Better understand customers' purchasing patterns."
5. Which step is the most time-consuming/most difficult/most expensive? Canyou quantify this? Why is that?
   "Keeping count manually, around 130 times a day."

6. Why did you decide to go for this solution/process?
   "This was the process followed by competitors"

7. Did you ever compare alternative solutions to solve problems? *"Not yet"*

8. How often do you experience problem?
   "2-3 times a week"

9. What don't you like about the current solution?
   "It is expensive and inefficient"

10. Have you ever tried to improve your current solution?
    "No"

11. Would you change anything today?
    "Would like to make the process inexpensive and reliable".

12. What is the maximum you would pay (to invest) to tackle a problem ? *"Rs 900/month"*

13. Are you paying for a solution today? *"Yes"*

Stories and observations

"With an autonomous system like Our project to keep a track of visitors we can better observe buying patterns and plan offers on the right products at the right time to maximize sales. The ability to get alerts when store is overcrowded to prevent risk of Covid transmission is an added bonus" - Rajeev

Problem Sizing

Problem: Users did not have accurate data about visitor count.

| 2 User segment (# users)		3 Frequency (# times/user)		4 Severity ($/time)
› 1.Yes, the problem affects a majority of users in the market around 10million. › Especially local users that aren't part of a chain or franchise.	×	1. The problem occours quiet often. 2. On a yearly basis it occours at least 60-100 times especially during festive season	×	› 1.Users pend around Rs. 700 every time to reduce the problem. 2.Solving the problem can save user upto Rupees 1 Lakh per year.
10,000		80		700

Rs. 56 Crore/Year

= Annual problem size

Key Takeaways

1.We need to ensure the system is reliable and has very low maintenance.
2. Should be easy to setup.
3. Must work with basic hardware.
4. Data gathered must be presented in an easy to understand manner.
5. Alarm to prevent overcrowding must work accurately.

3.Project Description

Our project aims to track the number of people present at a place using python & openCV code which uses optical flow tracker to track the person when one enters/leaves the room.
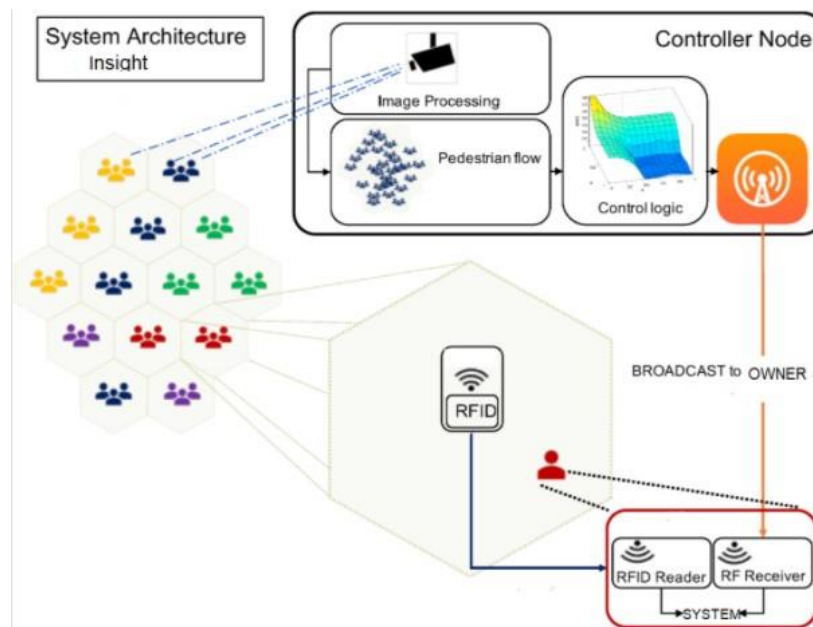
3.1 Illustrate the UI/ Input, output
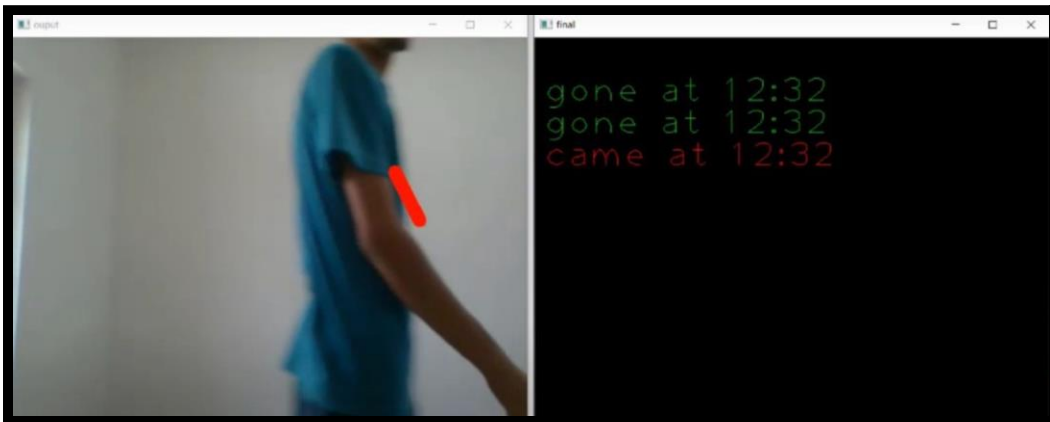
3.2 Technical Components of the project

- python
- openCV - CV2
- numpy
- matplotlib.pyplot

3.3 System Architecture

4.Business Plan

4.1 Key activities

- Product Development - Refine ui and add functionalities
- Business development - create and maintain support website
- Market research - assess user needs and add features they need
- Marketing

4.2 Key Resources

Code base

Developers, testers, UX designers, etc.

Licenses

PayPal's funds

Hardware and office equipment

4.3 Key Partners

- Banks
- Payment systems and gateways
- Hardware suppliers for camera ● eCommerce businesses

4.4 Value Propositions

- Better understand customer patterns and target sales accordingly.
- Reduces cost of operation.
- Our project helps implement COVID-19 norms at public places by preventing overcrowding.

4.5 Cost Structure

- Research and development
- Software maintenance
- Customer support
- Marketing expenses
  Software License - Rs. 899

4.6 Revenue Streams

- Software sales
- Camera sales

4.7 Customer Segment

- Store owners
- Malls & Theaters
- Restaurant owners
- Educational institutes

4.8 Customer Relationship

- Help center with FAQ
- Social Media
- Website

4.9 Channels

- Web version
- Online Software Stores like Microsoft store and app store
- Partnership -   Word of Mouth

5.*Financial Plan*

5.1 Growth Strategy

- **Start small**
- **Gradually Expand & Penetrate Market**
- **Product Development**
- **Diversification**
- **Increase growth when you're ready**

5.2 Traction

- Affiliate Program
- Public Relations
- Search Engine Marketing and Ads on social networks and display media ● Offline Media
- Email marketing

5.3 Financials

Income

- **Software licence sales**
- **Hardware sales (camera equipment)**

Expenditure

- **Website maintenance**
- **Software Development & Improvement**
  - **Customer Support & marketing**

Financials for three years

Year	Income	Expense
1	Rs.24,000	Rs.10,000 to Rs.25,000
2	Rs.64,800	Rs.20,000 to Rs.35,000
3	Rs. 1,00,000 to Rs.1,72,000	Rs.40,000 to Rs.75,000

6.Conclusion

Our project tracks the number of people that enter an area during the time that you specify using python & openCV code which uses optical flow tracker to track the person when one enters/leaves the room.

It is simple, economical and accurate.

Accurately counting traffic that enters your store or facility empowers organizations to make smarter business decisions. Avoid over or under-staffing by getting a better handle on your peak and slow times of the week.

With a people counter, you can measure which promotions work best.