Parshvanath Charitable Trust's
A. P. SHAH INSTITUTE OF TECHNOLOGY, THANE
(All Programs Accredited by NBA)
Department of Information Technology

CNN based Invisible QR code embedded Id cards

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1. Introduction

- Problem Identified :
  - ID card contains personal information of the person (e.g. Mobile no. , address etc), this information can be misused if fallen into wrong hands.
- Solution Proposed :
  - In the proposed system, we generate a QR code consisting of the user info and embed it (Invisible QR code) in the user Photo on the ID card.

2. Literature Review

Sr. No.	Authors	Paper Tittle	Methodologies	Findings
1.	Kaihua Song Ning Liu Zhongpai Gao Jiahe Zhang Xiao-Ping Zhang	DEEP RESTORATION OF INVISIBLE QR CODE FROM TPVM DISPLAY	•Temporal psychovisual modulation (TPVM). •deep convolutional neural networks (DCNN)	Embedding QR using TPVM and restoring it using DCNN
2.	Hiroyuki Kobayashi, Kohei Yamauchi	A CNN BASED INVISIBLE QR CODE GENERATOR FOR HUMAN LIVING SPACE	Using convolutional neural networks (CNN) for embedding and restoring image	This models compose of 2 CNNs and was able to embed and restore arbitrary information in the image.

3. Objectives

1. To provide data security by data hiding.
2. To maintain integrity and readability of the ID card by hiding the QR and providing necessary information.
3. To reduce data exposure and security threat.
4. To develop a QR code generator using pyqrcode module in python.
5. Embed the QR code generated in the required image using CNN.
6. To develop a QR scanner to decode the QR code.
7. Create a web based application which will generate report based on the data fetched from scanner.

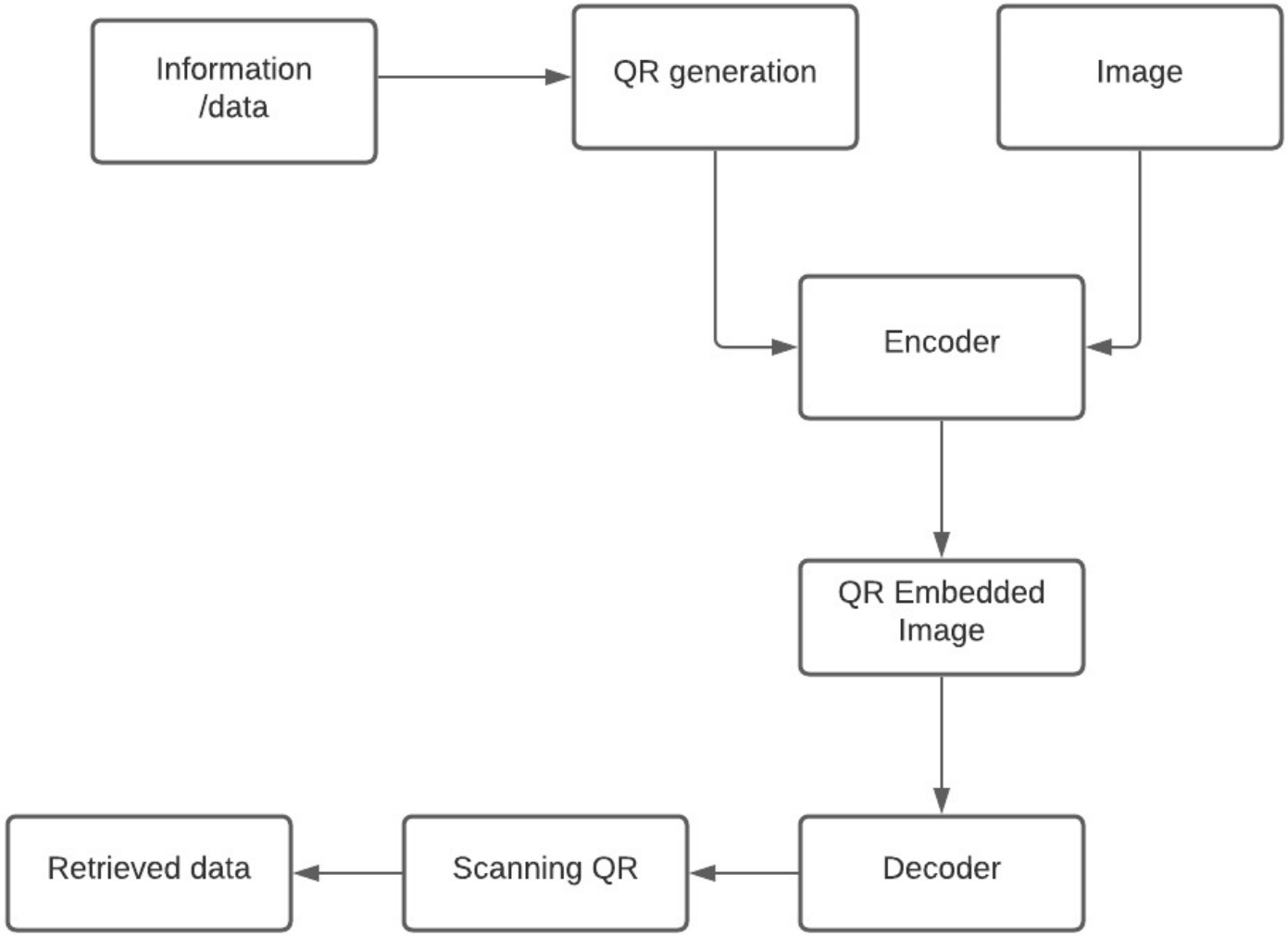
4. Scope

1. Can be applied in the educational institutions for maintaining and monitoring the attendance of the students.

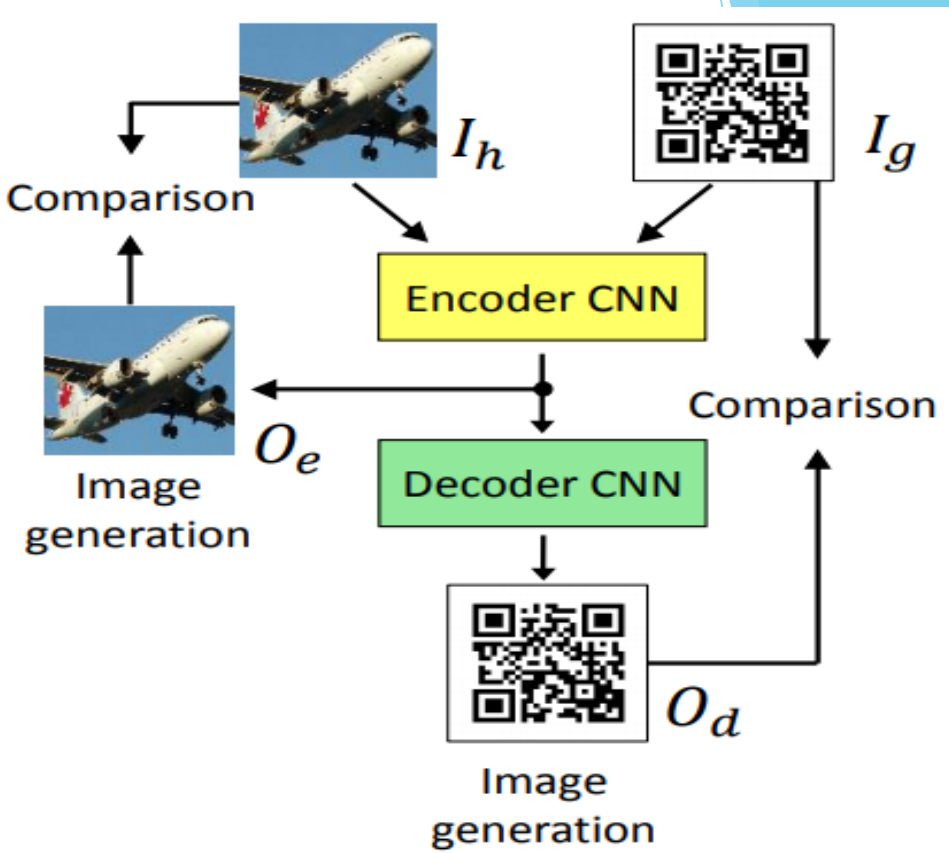
5. Technology Stack

1. Python (pyqrcode, numpy, matplotlib)
2. CNN (Tenserflow, keras)
3. MongoDB
4. Express
5. React
6. Node

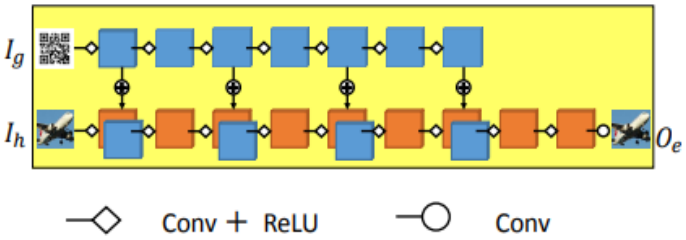
6. Block Diagram to propose project Idea



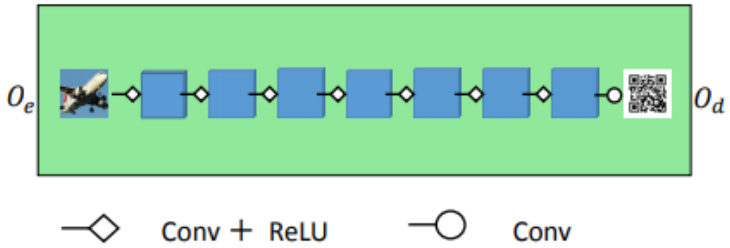
7. Demonstration (Desired)



Encoder CNN :



Decoder CNN :



***Source**: K. Yamauchi and H. Kobayashi, "A CNN based invisible QR code generator for human living space," IECON 2019 - 45th Annual Conference of the IEEE Industrial Electronics Society, Lisbon, Portugal, 2019*

8. References

1. K. Yamauchi and H. Kobayashi, "A CNN based invisible QR code generator for human living space," IECON 2019 - 45th Annual Conference of the IEEE Industrial Electronics Society, Lisbon, Portugal, 2019

2. K. Song, N. Liu, Z. Gao, J. Zhang, G. Zhai and X. -P. Zhang, "Deep Restoration of Invisible QR Code from TPVM Display," 2020 IEEE International Conference on Multimedia & Expo Workshops (ICMEW), London, UK, 2020

3. Zhongpai Gao, Guangtao Zhai and Chunjia Hu, **"The Invisible QR Code"**, MM '15 Proceedings of the 23rd ACM international conference on Multimedia, October 2015

Thank You...!!