

**BOSS = 8055**

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## **SAI KRISHNA MADDINA**

Embedded Engineer

*“This project literally tested my basic belief of looking at things from different perspectives that I had to look at Indian auto number plates in many environments and from every angle.”*



My one word  
**“PERSPECTIVES”**

**Innominds**

Connected Devices

**EMPLOYEE IMPACT**

Sai’s work became the foundation for Innominds video analytics platform – Numix

## Start of a new era at Innominds

Satya, a practice leader at Innominds Connected Devices BU, was driven to apply all his experience from Qualcomm and deep interest in camera technologies to build a new image processing solution. But, he wanted to start off with a point solution for local, India, needs of Automatic Number Plate Recognition (ANPR) and chose Sai, a young engineer for this project. *Did Sai live up to Satya's expectations?*

### The first test for Sai: Recognizing number plates from static images

This image processing project is like a dream come true for Sai, who always wanted to be in electronics field integrating hardware and software. Little did he knew that his academic skills were not sufficient to solve the first problem that Satya gave of recognizing alpha-numeric characters and number plates from static images of cars with OCR technology. He meticulously solved a number of image recognition problems.

#### Key highlights:

- Using the k-nearest neighbors algorithm (k-NN) for pattern recognition
- Identifying visual parameters of given images – e.g. finding edges, contours etc. as an initial phase of getting good at pattern recognition.
- Creating templates with thousands of number plate images and characters, and tuning a variety of image processing parameters to detect even the non-standard and funky styles used for fonts in Indian number plates

*Seeing the process and not only the results made Satya confident about Sai to work on the next task.*

### Recognizing number plates from videos (moving cars)

The first phase itself gave a glimpse for Sai of what he has got into, which he has been thoroughly enjoying despite tough challenges. This second phase of recognizing image patterns from moving cars is more complex and closer to the real on-the-ground environments. **Key highlights:**

- Tuning the image processing parameters to detect the right number in different lighting conditions, angles, distance from the car, varied car speeds, different camera fps etc.
- Developing multi-threaded processes to improve speed and optimize resource utilization
- And, lastly, testing in real conditions – on the road, in the parking lot, at places where people are moving etc.

Over a 6 month period, Sai had witnessed what it is to develop a product to solve a real-world challenge and greatly inspired by the way his manager, Satya, handled the activity of making this point solution lay a foundation for a larger vision of building Innominds Video Analytics Platform – Numix. Check out an overview of our solutions here – [Numix](#) and [ANPR](#).

## ABOUT SAI KRISHNA MADDINA

**Experience:** 3 yrs. in the IT industry

**Specialities:** Image Processing, Computer Vision, Machine / Deep Learning, Hardware Acceleration, Video Analytics, Edge Computing

**Hobbies:** Singing, Dancing, Events

## EXAMPLE OF ARTICLES SAI READ

- [ANPR article by “International Journal of Emerging Technology and Advanced Engineering”](#)
- [Number Plate Recognition for Indian Vehicles by “International Journal of Computer Science and Network Security”](#)
- [Highly Adaptive Indian High Security Vehicle Number Plate Recognition from “International Journal of Computer Applications”](#)

## INTERESTING CHALLENGES

### BOSS = 6055

Is a funky style of writing number plates that needs to be rightly recognized as a number from alphabets.

7 = 1

Is another example of how certain numbers look different when viewed from an angle that needs to be detected rightly.

*I always believed that young engineers can come together to build a new platform towards realizing a larger vision. The way Sai solved the problems with his meticulousness and keen interest has made my decision the right one in the process of building Numix, a video analytics platform*



### SATYANARAYANA KAKARA

Practice Head  
Multimedia & Imaging,  
Connected Devices

**About Innominds Connected Devices:** We help SoC providers, OEMs, Product Companies and Enterprises to design, build and launch connected devices & solutions faster with our embedded engineering services, industry solutions and production-ready building blocks. We ensure our clients realize full digital solutions by bringing together devices, applications and analytics.