

# Rappy Saha

## Experience and Interest

An industrial camera application developer based on various embedded platforms, specially, on FPGA. Gained distinct experience in the digital design sector during industrial camera development based on FPGA. At the same time, demonstrated research experience in academic by publishing journals in field of machine learning, image processing algorithm development as well as hardware Implementation. Currently, focused on the research of embedded AI field that links my previous experience and current job responsibility.

## Work History

### Ronix Inc., Seoul.

**Researcher.** (04/2019 - Current)

- Design and development of industrial camera solution from the system design to each individual module/IP development.
- Configured multiple custom image sensors and also developed custom bt1120 decoder-based IP.
- Gained experience various embedded platforms – Arm CPU, FPGA (Xilinx/Altera), ASIC, Soc, Microcontrollers (STM/AVR).
- Handled communication protocol – UART, I2C, SPI.
- Experienced with memory controller – DRR3/4, flash.
- Worked with several display controller – VGA, HDMI/DVI, SDI.

### Kookmin University, Seoul.

**Researcher and Research Assistant.** (03/2018 - 02/2019 and 03/2016 - 02/2018)

I was involved and leading to the several funded projects from Korean Government (NRF, ICT); company (Ronix Inc.). My experience during this time can be divided into two paths

- Machine learning based application development in the field of optical wireless communication and medical image classification.
- Development and implementation of image processing algorithm for the high dynamic range (HDR) applications and image fusion technology.

In this process, I have learned following things,

- Learned how to approach a research problem (SLR), idea development, solving the research question and finally, writing the research article.
- Proposal writing for research funding.
- Developed image processing algorithm, FPGA design, machine learning base applications, and also studied the optical wireless communication.

## Notable Projects

- [Welding vision camera.](#) *Developed FPGA Design for the core Camera functionality.*
  - Special image sensor, suited for the welding vision application, configured using FPGA. Capture raw image data, process the image data using ISP pipeline.
  - Develop basic on-screen display (OSD) engine for the application.
- [Welding vision Camera Controller.](#) *Firmware development for the targeted MiCom.*
  - Design the system firmware and the features of the DVI controller.
  - Handled communication protocol like UART and SPI to communicate between microcontrollers, outside device and to control the flash memory.
  - Controlling different ASIC chips with microcontroller using two wire communication protocol.

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## Links

<https://rappsaha.github.io/>  
[www.linkedin.com/in/rappy-saha](http://www.linkedin.com/in/rappy-saha)  
<https://github.com/rappsaha>

## Skills

- Vivado, Quartus Prime, Modelsim, STM IDE **Advanced**
- C, VHDL **Advanced**
- Matlab, Vivao HLS, Tcl **Intermediate**
- Git, Linux **Intermediate**
- C++, Python **Beginner**

## Education

**Kookmin University, Seoul**  
Master of Science: Electronics Engineering, 2018.  
CGPA: 4.5 out of 4.5  
**Thesis:** *Implementation of Image Sensor and Development of HDR Algorithm using HLS.*

**Khulna University of Engineering & Technology, Khulna, Bangladesh**  
Bachelor of Science: Electrical and Electronic Engineering, 2015.  
CGPA: 3.57 out of 4.00  
**Thesis:** *Arduino based home automation System*

## Language

**Bengali** Native  
**English** Advanced (IELTS - 7.5).  
**KOREAN** Basic communication (Level -1 Completed - KIIP).

## Publications

### Peer reviewed publications ([Google Scholar](#))

1. P. P. Banik, **R. Saha**, and K.-D. Kim, "An Automatic Nucleus Segmentation and CNN Model based Classification Method of White Blood Cell," *Expert Systems with Applications*, vol. 149, p. 113211, Jul. 2020. doi: 10.1016/j.eswa.2020.113211
2. **R. Saha**, P. P. Banik, S. S. Gupta, and K.-D. Kim, "Combining highlight removal and low-light image enhancement technique for HDR-like image generation," *IET Image Processing*, vol. 14, no. 9, pp. 1851–1861, Mar. 2020, doi: 10.1049/iet-ipr.2019.1099
3. P. P. Banik, **R. Saha**, and K.-D. Kim, "LED color prediction using a boosting neural network model for a visual-MIMO system," *Optics Communications*, vol. 437, pp. 139–147, Apr. 2019, doi: 10.1016/j.optcom.2018.12.027
4. **R. Saha**, P. P. Banik, and K.-D. Kim, "HLS Based Approach to Develop an Implementable HDR Algorithm," *Electronics*, vol. 7, no. 11, Art. no. 11, Nov. 2018, doi: 10.3390/electronics7110332.
5. P. P. Banik, **R. Saha**, and K.-D. Kim, "Regression analysis for LED color detection of visual-MIMO system," *Optics Communications*, vol. 413, pp. 121–130, Apr. 2018, doi: 10.1016/j.optcom.2017.11.086

### Conferences

1. P. P. Banik, **R. Saha**, T.-H. Kwon, and K.-D. Kim, "Fusing Reflectance based LDR Images to Generate HDR Image," in 2019 25th Asia-Pacific Conference on Communications (APCC), Nov. 2019, pp. 357–360, doi: 10.1109/APCC47188.2019.9026460
2. **R. Saha**, P. P. Banik, and K.-D. Kim, "Low Dynamic Range Image Set Generation from Single Image," in 2019 International Conference on Electronics, Information, and Communication (ICEIC), Jan. 2019, pp. 1–3, doi: 10.23919/ELINFOCOM.2019.8706401
3. P. P. Banik, **R. Saha**, T.-H. Kwon, and K.-D. Kim, "LED Color Detection of Visual-MIMO System Using Boosting Neural Network Algorithm," in 2018 Tenth International Conference on Ubiquitous and Future Networks (ICUFN), Jul. 2018, pp. 685–688, doi: 10.1109/ICUFN.2018.8436957
4. P. P. Banik, **R. Saha** and K. Kim, "Contrast enhancement of low-light image using histogram equalization and illumination adjustment," 2018 International Conference on Electronics, Information, and Communication (ICEIC), 2018, pp. 1-4, doi: 10.23919/ELINFOCOM.2018.8330564.
5. P. P. Banik, **R. Saha**, and K.-D. Kim, "HDR image from single LDR image after removing highlight," in 2018 IEEE International Conference on Consumer Electronics (ICCE), Jan. 2018, pp. 1–4, doi: 10.1109/ICCE.2018.8326106
6. **R. Saha**, P. P. Banik, and K.-D. Kim, "Conversion of LDR image to HDR-like image through high-level synthesis tool for FPGA implementation," in 2018 IEEE International Conference on Consumer Electronics (ICCE), Jan. 2018, pp. 1–2, doi: 10.1109/ICCE.2018.8326111
7. P. P. Banik, **R. Saha**, and K.-D. Kim, "Improvement of Color Detection by Regression Analysis of Visual-MIMO System," in 2017 IEEE Globecom Workshops (GC Wkshps), Dec. 2017, pp. 1–4, doi: 10.1109/GLOCOMW.2017.8269141
8. **R. Saha** and K.-D. Kim, "Add weighted algorithm based on the PICA and RBF neural network for image fusion," in 2017 International Conference on Electrical, Computer and Communication Engineering (ECCE), Feb. 2017, pp. 784–787, doi: 10.1109/ECACE.2017.7913009
9. **R. Saha**, Jai-Eun Kim, and Ki-Doo Kim, "Determination of threshold for IR image by using PICA with RBF neural network," in 2017 IEEE International Conference on Consumer Electronics (ICCE), Jan. 2017, pp. 223–224. doi: 10.1109/ICCE.2017.7889292

## Service

**Reviewer:** IEEE ACCESS (<https://publons.com/researcher/3052876/rappy-saha/peer-review/>)

**Technical Member:** IEEE Consumer Technology Audio/Video System and Signal Processing ([AVS](#)).

## Reference

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