

IIT Indore develops low-cost setup for imaging four combustion species using single DSLR camera

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Indian Institute of Technology Indore in collaboration with the University of Gothenburg Sweden and NASA-Caltech, USA has developed a low-cost camera setup 'CL-FRAME', which will provide snapshot multispectral imaging of four chemical species in a flame using single DSLR camera.

This project is supervised by Dr Yogeshwar Nath Mishra, NASA-Caltech & University of Gothenburg and Prof Devendra Deshmukh, IIT In-

dore, with Devashish Chorey, PhD scholar, IIT Indore, being the lead author of this study.

Mishra said, "Combustion, from cooking food to burning fuels in rockets and aeroplanes, is an integral part of our activity, thus requiring a better understanding of combustion phenomena. In a normal setting to do the same job, we require four cameras and four objective lenses, therefore, increasing the cost and complexity of the setup. Here, we have used a single DSLR camera to capture critical chemical species of the



combustion process CH^* and C_2^* and the temperature of the flame."

Deshmukh said, "We have used the method of Structured Illumination (SI), which allows for simultaneous imaging of multiple species. Structure Illumination enables us to

image low-intensity species such as CH^* , using a DSLR camera which usually requires intensified CCD cameras. We are planning to explore the applications of the approach in biomedical imaging, ultra-fast imaging, multidimensional, and other advanced

studies in combustion."

The authors published this study in the 'Applied Optics' Journal of the Optical Society of America (Optica), and believe that with the ever-increasing demands for resources for scientific investigations, such techniques, and approaches are essential for a developing country like India to compete in the global stage with lower resources.

"This low-cost setup can be developed for research in labs that are lacking high-end equipment and camera systems," a release issued by IIT Indore said.