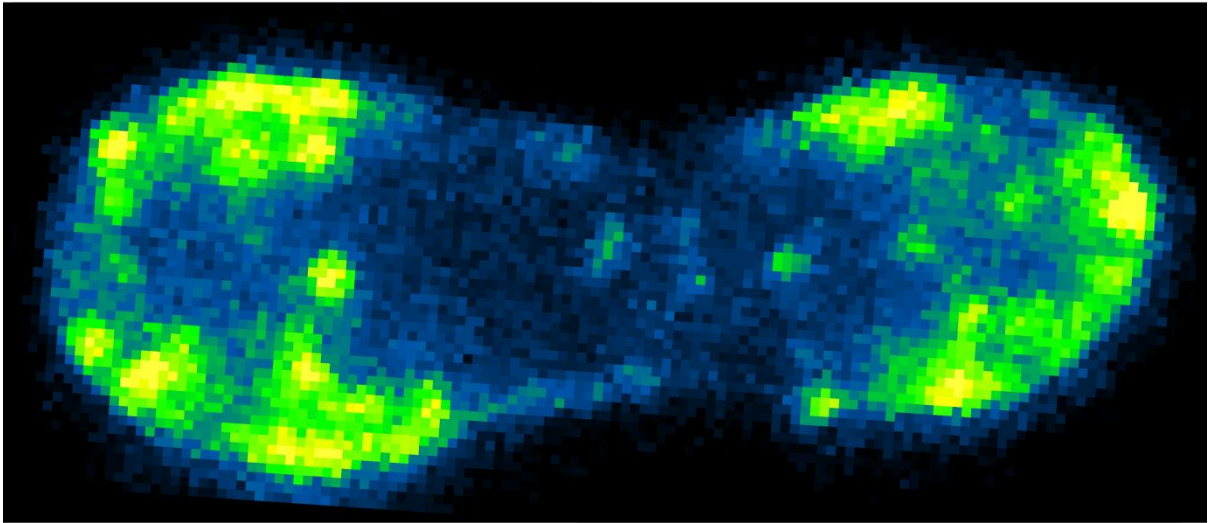


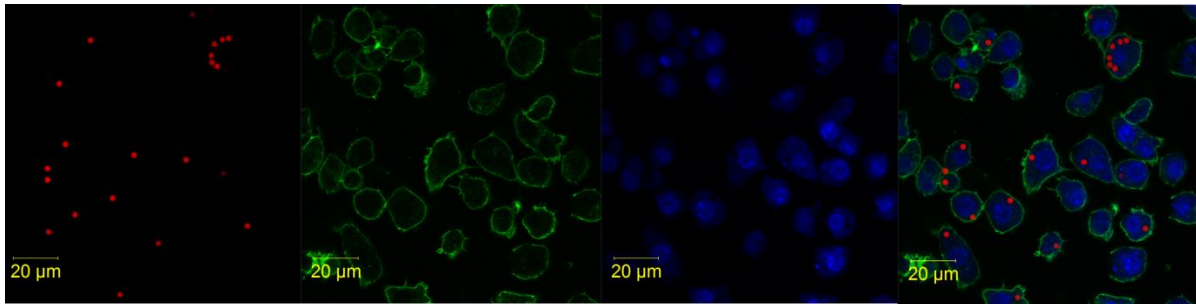
1. Vaishnavi Ananthanarayanan (BSSE)



In this study, by employing quantitative microscopy and image analysis, the researchers discovered that the actin-based myosin I motor regulates the activity of the microtubule-based cytoplasmic dynein in fission yeast. The image is that of fluorescent anchor protein clusters of cytoplasmic dynein on the cortex, visualized using confocal microscopy.

REFERENCE: JM Thankachan, SS Nuthalapati, NA Tirumala, **V Ananthanarayanan** (2017) Fission Yeast Myosin I Facilitates PI(4,5)P₂ –mediated Anchoring of Cytoplasmic Dynein to the Cortex. *Proc. Nat. Acad. Sci.* 114: E2672-E2681

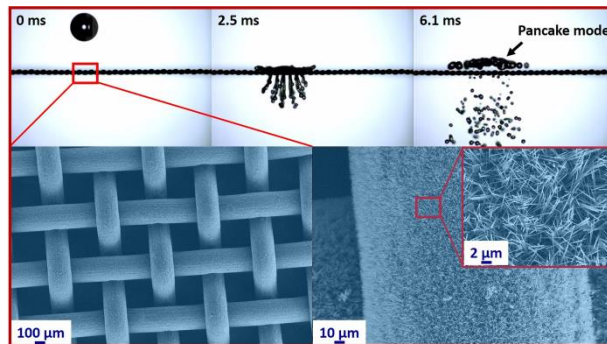
2. Siddharth Jhunjunwala (BSSE)



The image shows uptake of particles (red) by phagocytic immune cells (nuclei in blue and cytoskeleton in green). The researchers were interested in developing surface modifications that enhance or prevent interaction of nano/micro particles with immune cells.

REFERENCE: P Sharma, V Gadiyar, V Neelakantan, V Shankar, **S Jhunjunwala** (2018). Presented at *Nanobiotech* 2018 (submitted for peer review).

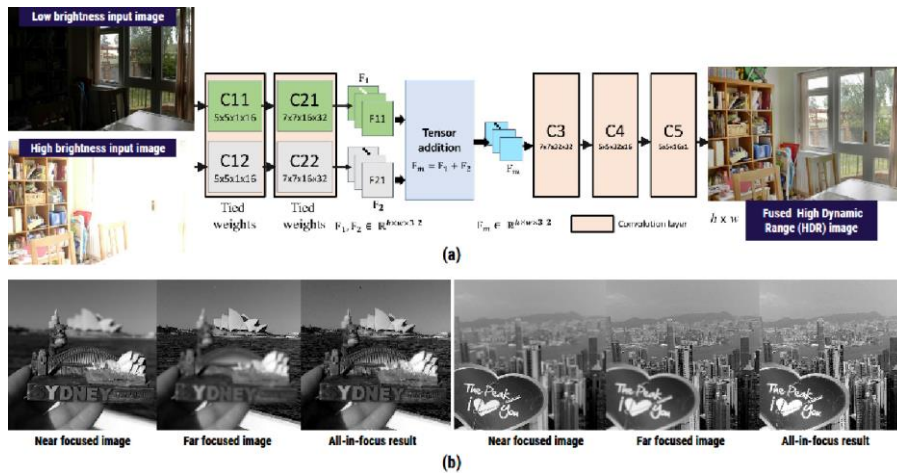
3. Prosenjit Sen (CeNSE)



Meshes are observed ubiquitously in several applications. Understanding the dynamics of droplet impact on such meshes with controlled surface wettability is of paramount importance for development of surfaces with enhanced functionality. The authors have studied the effect of various geometrical parameters on the rebound of the impacting droplets on superhydrophobic meshes.

REFERENCE: A Kumar, A Tripathy, Y Nam, C Lee and **P Sen** (2018) Effect of geometrical parameters on rebound of impacting droplets on leaky superhydrophobic meshes. *Soft Matter*. DOI: 10.1039/C7SM02145C

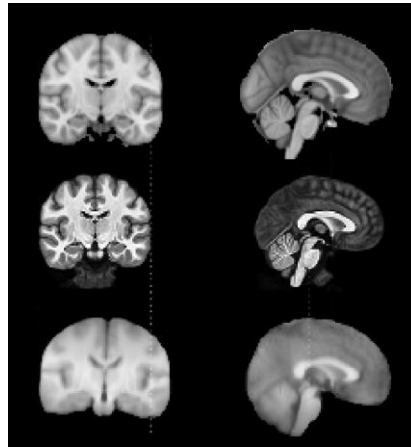
4. Venkatesh Babu (CDS)



This work proposes a deep learning framework for fusing extreme exposure (low and high) images to create a HDR image. This is the first data-driven approach for image fusion. The proposed fusion is generic in nature and could be easily adapted to other problems such as Multi-focus fusion. The proposed deep model is suitable for embedded devices such as mobile phones for creating high quality HDR photographs.

REFERENCE: KR Prabhakar, VS Srikar, and RV Babu (2017) DeepFuse: A Deep Unsupervised Approach for Exposure Fusion with Extreme Exposure Image Pairs. *Proceedings of IEEE International Conference on Computer Vision (ICCV)*, 4714-4722.

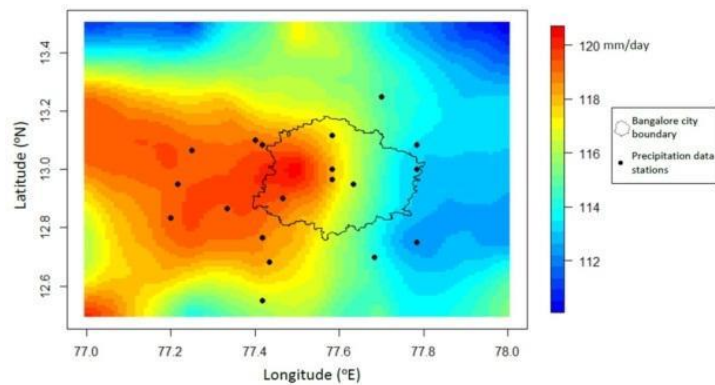
5. Phaneendra Yalavarthy (CDS)



Brain templates provide a standard anatomical platform for population based morphometric assessments, used in diagnosis of neurological disorders. Typically, standard brain templates for such assessments are created using Caucasian brains, which may not be ideal to analyse brains from other ethnicities. This study developed first Indian brain template in collaboration with NIMHANS, Bangalore, which is currently being used in assessing Dementia, Schizophrenia, and Bipolar disorders.

Reference: N Rao, H Jeelani, R Achalia, G Achalia, A Jacob, RD Bharath, S Varambally, G Venkatasubramanian, and **PK Yalavarthy** (2017) Population differences in Brain morphology: Need for population specific Brain template Psychiatry research. *Neuroimaging*. 265, 1-8

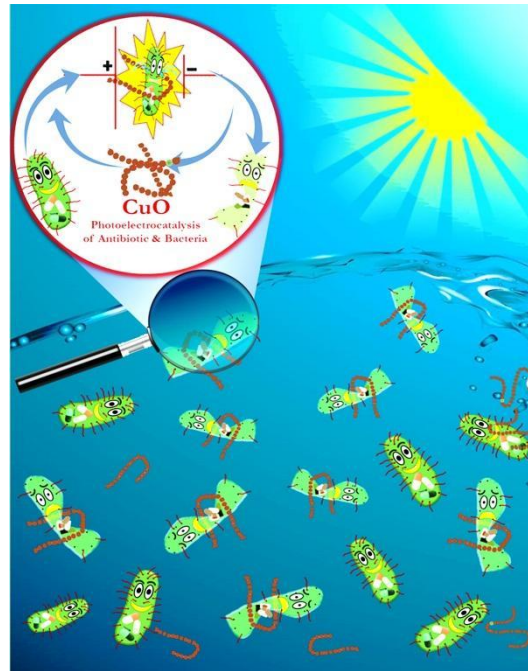
6. P. Mujumdar (ICWaR)



A general methodology has been developed, using the Bayesian Hierarchical Model for quantification of uncertainty in spatial distribution of urban precipitation extremes, to provide crucial input for urban flood risk assessment and modelling. The figure shows spatial map of precipitation intensity of a ten-year return period in and around Bangalore city.

REFERENCE: RC Rupa and **PP Mujumdar** (2018) Quantification of Uncertainty in Spatial Return Levels of Urban Precipitation Extremes. *ASCE Journal of Hydrologic Engineering*. 23(1): 04017053.

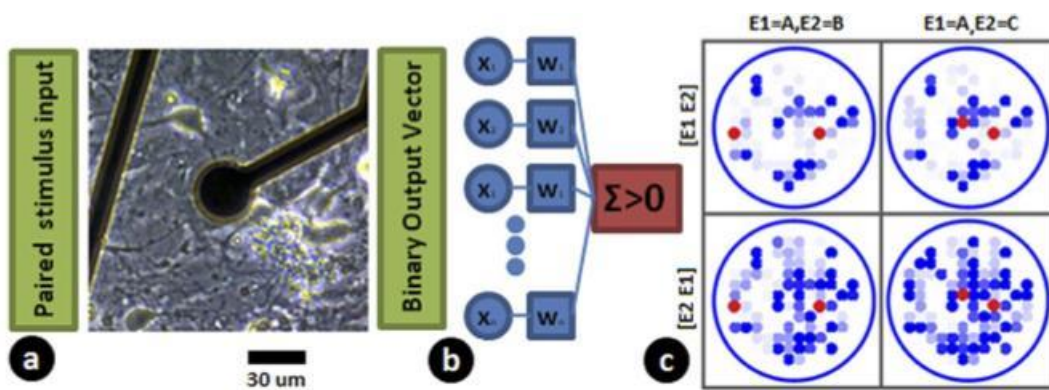
7. Giridhar Madras (ICER)



This image depicts the fate of antibiotic and bacteria in the contaminated water during photoelectrocatalysis process using solution combustion synthesized copper oxide. A new material (network structured copper oxide) was synthesized which on the application of light and potential inactivates the bacteria and degrades the antibiotic simultaneously. This prevents the bacteria from becoming drug resistant.

REFERENCE: NKR Eswar, SA Singh and **G Madras** (2018) Photoconductive network structured copper oxide for simultaneous photoelectrocatalytic degradation of antibiotic (tetracycline) and bacteria (*E. coli*), *Chemical Engineering Journal*, 332: 757-774.

8. Bharadwaj Amrutur (RBCCPS)

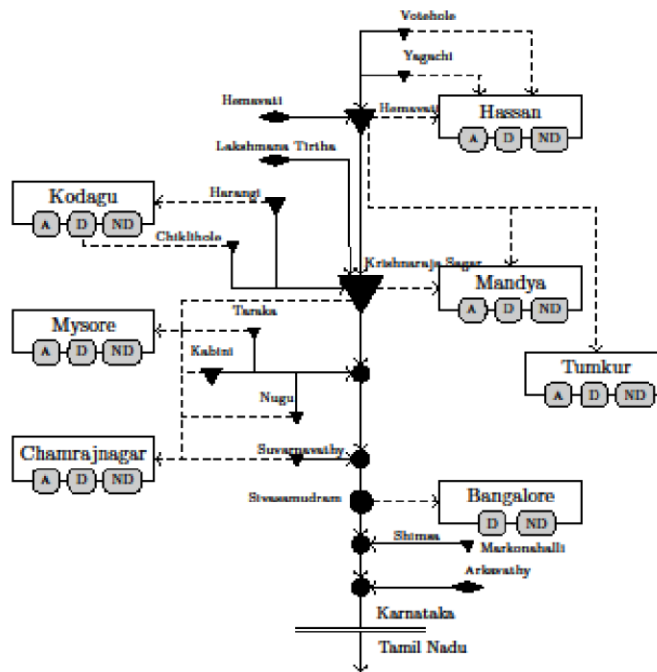


The study investigates how neuronal cultures grown in-vitro can be used for computation in hybrid neuro-electronics systems. Figure shows the architecture of a proposed system consisting of the culture paired with a perceptron decoding layer to achieve classification of four types of input stimuli.

Reference: JB George, G Abraham, Z Rashid, **B Amrutur**, and S Sikdar (2018) Random neuronal ensembles can inherently do context dependent coarse conjunctive encoding of input stimulus without any specific training. *Nature Scientific Reports*. 8:1403.

DOI:10.1038/s41598-018-19462-3)

9. Parthasarathy Ramachandran (MGMT)



The study attempted to understand the optimal water allocation in a river basin among competing users with basic water right for consumptive use. The image is a node network diagram of the study area: Upper Cauvery river basin.

REFERENCE: SS Patel and **P Ramachandran** (2018) An Optimization Model and Policy Analysis of Water Allocation for a River Basin. *Sustainable Water Resource Management* (In Press) DOI: 10.1007/s40899-017-0124-5.