Fusion Techniques

Group - 12
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What is Fusion?

Input: Several images of the same scene

Output: One image of higher quality

Type of Fusion Technique

1. Multiview fusion
2. Multimodal fusion
3. Multitemporal fusion
4. Multifocus fusion
5. Fusion for image restoration

Multiview Fusion

- Images of the same modality, taken at the same time but from different places or under different conditions.

Goal: to supply complementary information from different views

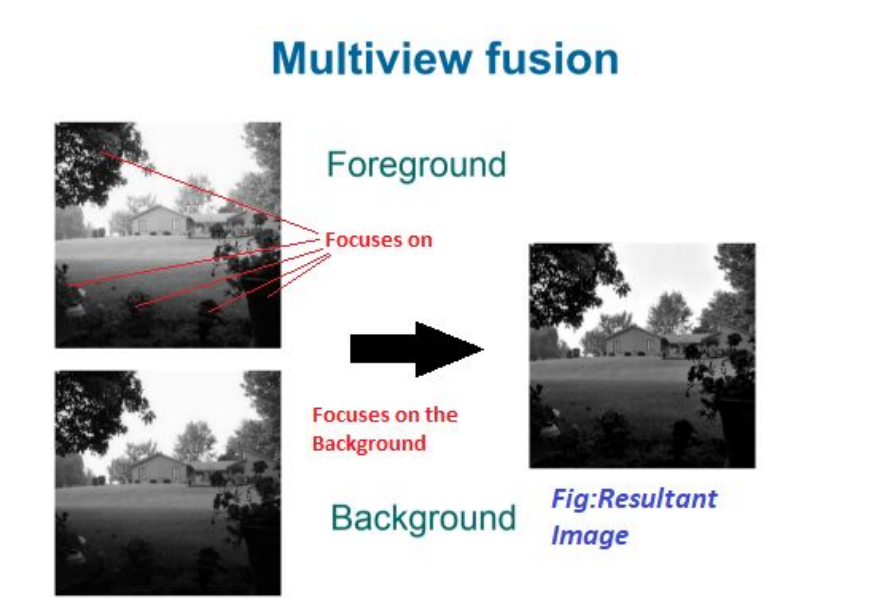


Figure: Multiview fusion of the same place and identical view but with different conditions.

Multiview Fusion

The image below is taken from www.researchgate.net which shows the multiview fusion on neuronal aggregates. The upper row (A, B, C) are the result of the fused image. The images were taken using the same depth colour map and by keeping the conditions identical. Only the angle of rotation was changed(45 °).

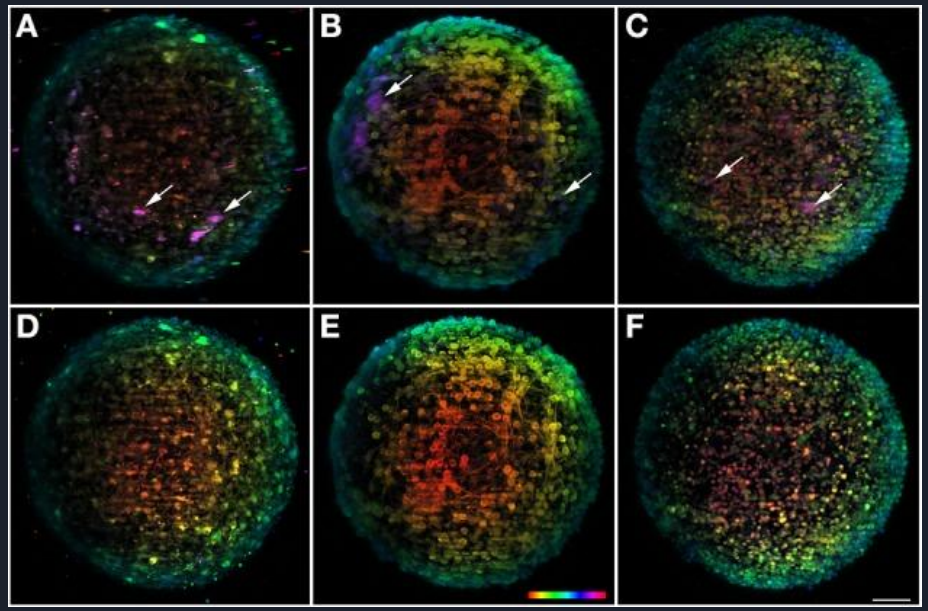


Figure: Results show that some neurons are detected (shown by the white arrow in A, B, C) which were undetectable in a single view.

Multimodal Fusion

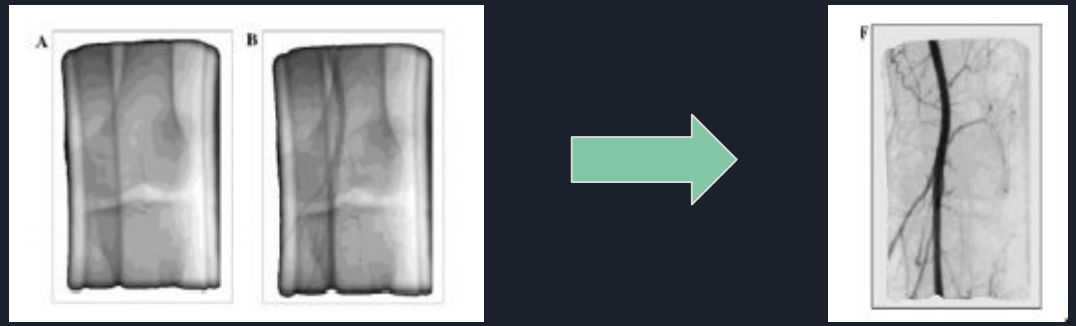
- Images of different modalities: PET, CT, MRI, visible, infrared, ultraviolet, etc.

Goal: to decrease the amount of data, to emphasize band-specific information

Multitemporal Fusion

Images of the same scene taken at different times

Goal: Detection of changes



Multifocus fusion

The original image can be divided into regions such that every region is in focus in at least one channel

Goal: Image everywhere in focus

Method: identify the regions in focus and combine them together

Multifocus Fusion

Fusion for image restoration

Each image consists of “true” part and “degradation”, which can be removed by fusion