

# Reconstruction of 1-D signals from irregularly sampled data

## A project proposal

**Vamsidhar Juvvigunta ( vamsi@erc) Nagamohan Kompella (mohi@erc)**  
**Balakrishna Nakshatrala (balki@erc)**

This project deals with the reconstruction of signals from irregularly sampled data. The motivation for this project is the bigger problem of feature detection in unstructured grids. This feature detection is proposed to be used for the detection of shocks in the flow field solved on unstructured grids. This will help in evolving strategies for localizing the region of the grid that needs adapting. Though this problem is in 2-D space, our project will deal with the reconstruction of 1-D signals from irregularly sampled data.

The project will involve the implementation and comparison of three algorithms for the reconstruction, namely....

- 1) The projection onto convex sets (POCS) method
- 2) The adaptive weights method (ADPW)
- 3) The Voronoi method or the Frame (WILMAR) method (Wiley / Marvasti)

The criteria for comparison will be convergence, error estimates, computational expense etc.

### Assumptions:

The main assumption these algorithms make is that the signal is band limited.

### Time table for progress:

- Sept 15<sup>th</sup> : Completion of literature survey and final detailed proposal.
- October 31<sup>st</sup> : Implementation of all three algorithms by this date.
- November 15<sup>th</sup> : Debugging and testing of code with real data.

