

Sampling Theorems and Variable Bandwidth (University of Vienna, Supervisor: K. Gröchenig)

The project is in the area of applied harmonic analysis and deals with new notions of variable bandwidth with time-frequency methods and corresponding sampling theorems. The goal is to find suitable mathematical concepts of variable bandwidth and investigate their properties. This is done best with methods from time-frequency analysis, for instance by truncating the frequency part of the spectrogram or of a Gabor expansion.

On the theoretical side, one needs to determine necessary density conditions for sampling, and more importantly, sufficient density conditions and derive sampling theorems. This part of the project requires a good knowledge of time-frequency methods, of the theory of Gabor frames, and of functional analysis. On the numerical side, one needs to develop and implement reconstruction algorithms from samples; this part of the projects has a strong engineering flavor and requires computational skill and some fluency in Matlab programming.

The successful candidate will be part of the Numerical Harmonic Analysis group at the Faculty of Mathematics of the University of Vienna. Applications have to be sent via the Job Center of the University of Vienna at the [Reference number 10407](#). The deadline for application is **February 20, 2020**.