CURRENT TRENDS IN RADIO IMAGE SYNTHESIS

PABLO ROMAN

Abstract. The Image synthesis or Fourier synthesis problem corresponds to the process of recovering an image from a noisy sparse sampling of its Fourier transform. This problem has been traditionally solved for the case of regular grids enabling the application of current digital technology in the framework of the NyquistShannon sampling. For sparse sampling the inversion problem turns out to be ill-posed and motivates recent research in the field. Image Synthesis is an important task in Radio-Astronomy since measured quantities are taken from the Fourier transform of the image. The CLEAN algorithm (equivalent to Matching Pursuit) perform the task with a degree of success but without a theoretical assessment of the resulting image. Much of the ongoing research in this field involves novel tools like compressed sensing and faster optimization algorithms in high dimensional spaces. In this this talk I will review current research directions and highlight open questions.

Universidad de Chile
E-mail address: proman@ing.uchile.cl