Compressive Sensing with Structured Random Measurements

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Compressive sensing is a recent area of mathematical signal processing that predicts that sparse vectors can be reconstructed from incomplete linear information via efficient algorithms such as ℓ_1-minimization. This principle has many applications, for instance, in medical imaging, radar, wireless communications and astronomical signal processing. So far all provably optimal measurement processes are modeled with random matrices. Many applications require structure in the measurements which leads to the study of structured random matrices including random partial Fourier matrices, partial random circulant matrices (subsampled random convolutions) and time-frequency structured random matrices. The talk gives a short introduction to compressive sensing focussing on the role and the analysis of (structured) random matrices in this context.