

Fourier Analysis from a Function Space View-point

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Key aspects of my talk

- 1 Browse the (long-standing) **history of Fourier Analysis**
- 2 Describing basic **time-frequency and Gabor analysis**
- 3 Which questions do we need to treat in this setting
- 4 Which function spaces are suited best
- 5 Definition and properties of **modulation spaces**
- 6 The Banach Gelfand-Triple $(S_0, L^2, S'_0)(\mathbb{R}^d)$



Probably to be modified later on!!

Overall it will be explained, that the distributional view-point is nowadays more important than the fine analysis of L^p -spaces using Lebesgue integration methods. The setting of the *Banach Gelfand Triple* $(\mathcal{S}_0, L^2, \mathcal{S}'_0)(\mathbb{R}^d)$ appears to be highly suitable for many applications.

There are many open questions related to time-frequency and Gabor analysis. In addition the computational side of Harmonic Analysis is not yet well integrated into the overall investigations in the area. Therefore the idea of *Conceptual Harmonic Analysis*, which includes (and integrates) both Abstract Harmonic Analysis and Numerical Harmonic Analysis, should be developed further.

