

Characterization of function spaces and boundedness of bilinear operators through Gabor frames.

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Abstract:

In this thesis, We use Gabor frames, and more generally time-frequency analysis techniques to characterize function spaces, and to study the boundedness of bilinear pseudodifferential operators. In particular, we give a description of the class of Banach spaces known as amalgam spaces in terms of Gabor frames. Moreover, we prove some boundedness results of bilinear pseudodifferential operators on the so-called modulation spaces. Additionally, we state and prove sufficient conditions for membership in the modulation spaces, by proving embeddings of some classical Banach spaces into them.