

Titolo del corso: The Total Variation Flow

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Ore frontali di lezione: 10

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Settore/i disciplinare del corso: MATH-03/A Analisi Matematica

Tipologia di corso: Avanzato

Modalità di verifica dell'apprendimento: Seminario su tema scelto.

Abstract del corso:

We summarize in these lectures some of our results about the Minimizing Total Variation Flow, which have been mainly motivated by problems arising in Image Processing. First, we recall the role played by the Total Variation in Image Processing, in particular the variational formulation of the restoration problem. This model, initially introduced by Rudin, Osher and Fatemi, had a strong influence on the development of variational methods for image denoising and restoration, and pioneered the use of the BV model in Image Processing. After this analysis we outline some of the tools we need: functions of bounded variation, paring between measures and bounded functions and gradient flows in Hilbert spaces. Next, the Minimizing Total Variation Flow under different boundary conditions is studied and its main qualitative properties are exhibited. In particular, several explicit solutions are computed.

Programma del corso:

- 1.- Total Variation Flow in Image Processing
- 2.- Functions of Bounded Variation
- 3.- Paring between Measures and Bounde Functions
- 4.- Gradient Flows in Hilbert Spaces
- 5.- The Neumann Problem for the Total Variation Flow
- 6.- The Cauchy Problem for the Total Variation Flow.