Game Theory Module
for STRATEGOS, International MSc in Strategic Engineering
Prof.Lucia Pusillo

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Lucia Pusilla is an active researcher in Mathematical Analysis, since 1993; She is dedicated to research in Game Theory. Her scientific production is essentially focused in Game Theory applied to Mathematical Analysis as Well-posedness problems for Nash equilibria, stability problems, applications to multicriteria games, dynamic games with two levels and oligopoly problems in the static and in the dynamic cases.
She learns from many years courses of mathematical Analysis for the courses of studies in Phisics, Game Theory for the courses of studies in Mathematics and Informatics.
She has further learnt Mathematical Analysis for SMID and Mathematics to the Specilization School of Medical Radiology of the Faculty of Medicine, a course of Mathematics for Radiology Techniques and Political Sciences.
Now, further the courses of Mathematical Analysis for Phisics, of Mathematics for Medicine and game Theory for mathematics and informatics, she learns a course of Mathematical Models for Ambiental Sciences.
She was a participant in many meetings with communications about har researches.
Among the last ones, the following:

- Tucson AZ (USA), 18-21 December 2004, XI International Symposium on Dynamic Games and Applications. "Potential Games and well-posedness: Static and Dynamic Cases"
- Turin (Italy), 18-22 July2005, IFIP-Conference on System Modelling And Optimization. "Potential Games and well Posedness"
- Erice, Sicily (Italy), 5-14 July 2006, 44th Workshop on Variational Analysis and Partial Differential Equations- (in memory of S.Campanato). "Well posedness and Potential Games"
- Milan (Italy), 24-25, May 2007, Workshop on Well-posedness. "Stackelberg well-Posedness and Dynamical Games"
- Madrid (Spain) 4-6 July 2007, SING III Spain Italy Netherlands Meeting On Game Theory. " Approximate Evolutionary Stable Equilibria"
- Padov (Italy), 10-11 Spetember 2007, Workshop Marketing Decision Models, Dynamic Optimization And Game Theory. "Potential Games and well Posedness in the Static and Dynamic Cases"

The main topics studied includes :
1) Approximations of solutions in Game Theory
2) Applications of Game Theory and problems arising from it.

About the first one and in the topic of non-cooperative games, she has conducted reserarches on:

-Tihkonov well-posedness for Nash equilibria (in particular for a special class of games as games with ordinal , generalized potentials and for oligopoly models) and for Stackelberg equilibria.

The idea of Tihkonov well-posedness (and more general the role of approximate solutions and of stability of the dates respect to perturbation of the dates) was studied in:

- L.Pusillo "Well Posedness and Optimization Problems" in Variational Analysis and Applications-edited by Giannessi F. and Maugeri A. – Springer -2005
- M.Margiocco e L.Pusillo " (epsilon,k) Equilibria and Well Posedness" International Game Theory Review 2006 , vol.8, n.1 , pp.33-44, 2006
- M.Margiocco a L.Pusillo ' Potential Games and well-Posedeness Properties" to appear on Optimization

A studied subject was also a concept od well-posedness with the property of ordinality, In fact for games is more important the the preferences of players then their utility functions. Part of these results are summarized in the paper: M.Margiocco e L.Pusillo " An ordinal well-posedness property for Nash equilibria (submitted)

In collaboration with M.Margiocco of the University of Genoa, she studied dynamic games and a definition of well-posedness for Stackelberg eequilibria.
She studied concepts previously given by prof. J.Morgan of the University of Naples,
These results are summarized in the paper: M.Margiocco e L.Pusillo " Stackelberg Well Posedness and Hierarchical Potential Games" Annals of Dynamic Games. 2006

In the last years with prof.Tijs of the University of Tilburg and visiting professor In the Department of Mathematics of the University of Genoa, she has studied multicriteria games with particular regard to potential games and she gave a new characterization of approximate Pareto equilibria. The results of this research are written in the paper:
F. Patrone-L.Pusillo e S.Tijs " Multicriteria games and Potentials" ,TOP.
With prof. Tijs and prof.Mallozzi (University of Naples) she studied further Bayesian games or games with imperfect information introduced by Harsanyi.

A new concept of approximate solution was introduced for these games existence theorems for the solutions of these games were given.
These results are summarized in the paper: L.Mallozzi, L.Pusillo e S.Tijs " Approximate equilibria for Bayesian games" , JMAA

About applications in Game Theory, she studied with prof.Tijs and proff.Torre and Caprari of the University of Pavia also cooperative games.

This study has leaded to a first result in: E.Caprari, F.Patrone, L.Pusillo, S.Tijs, A.Torre “ Share Opportunity Sets and Cooperative games” , International Game Theory Review.