

## Remarks on lower semicontinuous solutions of Hamilton-Jacobi-Bellman equations

Arkadiusz Misztela, *Szczecin, Poland*

This talk is devoted to lower semicontinuous solutions of Hamilton-Jacobi equations with convex Hamiltonians in the gradient variable. Such Hamiltonians do arise in the optimal control theory. We present a necessary and sufficient condition for the reduction of the Hamiltonian satisfying optimality conditions to the case when the Hamiltonian is positively homogeneous and also satisfies optimality conditions. On one hand it allows us to reduce uniqueness of solutions problem to Barron-Jensen [1] and Frankowska [2] theorems. On the other hand it shows us the limits of applicability of this reduction. For Hamiltonians which are not subject to the above reduction we present the new existence and uniqueness theorems.

- [1] Barron E.N., Jensen R., Semicontinuous viscosity solutions for Hamilton-Jacobi equations with convex Hamiltonians, *Comm. Partial Differential Equations*. – 1990 – 15(12) – pp. 1713-1742.
- [2] Frankowska H., Lower semicontinuous solutions of Hamilton-Jacobi-Bellman equations, *SIAM J. Control Optim.* – 1993 – 31(1) – pp. 257-272.