

seminář

# Beseda KPMS

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## Instrumental Variable Approaches To Individualized Treatment Regimes Under A Counterfactual World.

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**Abstrakt:** There is a fast-growing literature on estimating optimal treatment regimes based on randomized trials or observational studies under a key identifying condition of no unmeasured confounding. Because confounding by unmeasured factors cannot generally be ruled out with certainty in observational studies or randomized trials subject to noncompliance, we propose a robust classification-based instrumental variable approach to learning optimal treatment regimes under endogeneity. Specifically, we establish identification of both value function for a given regime and optimal regimes with the aid of a binary instrumental variable, when no unmeasured confounding fails to hold. We also construct novel multiply robust classification-based estimators. In addition, we propose to identify and estimate optimal treatment regimes among those who would comply to the assigned treatment under a monotonicity assumption. Furthermore, we consider the problem of individualized treatment regimes under sign and partial identification. In the former case, i) we provide a necessary and sufficient identification condition of optimal treatment regimes with an instrumental variable; ii) we establish the somewhat surprising result that complier optimal regimes can be consistently estimated without directly collecting compliance information and therefore without the complier average treatment effect itself being identified. In the latter case, we establish a formal link between individualized decision making under partial identification and classical decision theory under uncertainty through a unified lower bound perspective.