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STATISTICAL ANALYSIS OF JUDGMENTS SPECIFIED PARTIALLY IN ANALYTIC HIERARCHY PROCESS

Prasanta Basak
Pennsylvania State University at Altoona
3000 Ivyside Park
Altoona, PA 16601
USA
fkv@psu.edu

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Summary: *The Analytic Hierarchy Process (AHP) is a decision-making tool, which yields priorities for the decision alternatives. This paper proposes a new approach to elicit and synthesize expert assessments for group decision process in AHP. These new elicitations are given as partial probabilistic specifications of the entries of pairwise comparisons matrices. For a particular entry of the matrix, the partial probabilistic elicitations could arise in the form of either probability assignments regarding the chance that entry falling in specified intervals or selected quantiles for that entry. A new class of models is introduced to provide methods for processing these partial probabilistic information. One advantage of this approach is that it allows to generate as many pairwise comparisons matrices of the decision alternatives as one desires. This, in turn, allows us to determine statistical significance of the priorities of decision alternatives.*