Interval-Related Talks at the IEEE World Congress on Computational Intelligence WCCI 2024 (Yokohama, Japan, June 30 - July 5, 2024)

Vladik Kreinovich
University of Texas at El Paso, El Paso, Texas 79968, USA
vladik@utep.edu

Uncertainty is ubiquitous. Taking uncertainty into account leads to more accurate modeling and thus, to more adequate recommendations. Measurement results come with probabilistic or interval uncertainty, expert estimates come with what is mathematically described as fuzzy uncertainty.

Several papers presented at this conference take into account both interval and fuzzy uncertainty, leading to better application results. Corresponding applications include:

- agriculture and food industry, where these methods lead to better predictions of wine properties [6, 9];
- civil engineering, where these methods lead to a better fault detection in small-community water systems [8], and where variable speed limits recommended by these methods decrease road congestion [1];
- electrical engineering, where we get better forecasts of wind power in microgrids [3];
- industrial engineering, where we get better predictions of the wear depth of electroless coating [2];
- medicine, where these methods lead to better predictions for Parkinson and AIDS patients [6, 9], to better detection of patient falls [11], and to better injury prediction for soccer players [4];
- recommender systems, where these methods lead to more helpful recommendations [2].

Many of these papers use innovative techniques and specially designed tools that can be utilized in other applications as well.

Several papers describe new ideas and techniques that can be used in many applications:

- paper [7] shows how to test statistical hypotheses when we only know the data with interval uncertainty;
- paper [10] shows how to compare intervals and thus, how to make decisions under interval uncertainty;
- paper [5] shows how to take interval uncertainty into account in multi-criteria decision making.

Finally, paper [12] shows how to come up with a "typical" interval that adequately represents a family of intervals.

References

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