

## Intelligence inferred by randomness

Yoshiyasu Takefuji

Pierre Azoulay et al. wrote a collection of articles entitled “Toward a more scientific science” (1). Intelligence used in meta-analysis inherently is inferred by random numbers. A variety of machine learning algorithms are all based on random numbers in order to solve intractable problems. Inductive methods or statistics are based on random numbers where randomness plays a key role in inferring wisdom. ‘The wisdom of crowds’ refers to the phenomenon in which the collective knowledge of a community is greater than the knowledge of any individual where random numbers play an important role (2). However, the problem of inductive methods or statistics lies in uncertain conclusion. As long as the statistics is based on inductive reasoning and/or statistical syllogisms, the machine learning’s conclusion is inherently uncertain (3). Therefore, deductive methods will play a key role in building intelligent systems combined with inductive methods. Deductive methods can always eliminate uncertain conclusion.

### References:

1. Pierre Azoulay et al., Toward a more scientific science, *Science* 21 Sep 2018: Vol. 361, Issue 6408, pp. 1194–1197
2. Surowiecki, J. *The Wisdom of Crowds: Why the Many are Smarter than the Few and How Collective Wisdom Shapes Business, Economies, Societies and Nations* (Doubleday, 2004).
3. Y. Takefuji, Inductive and deductive reasoning must be merged for enhancing prediction and breaking its limits, *Science* (eLetter, 8 April 2017)  
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