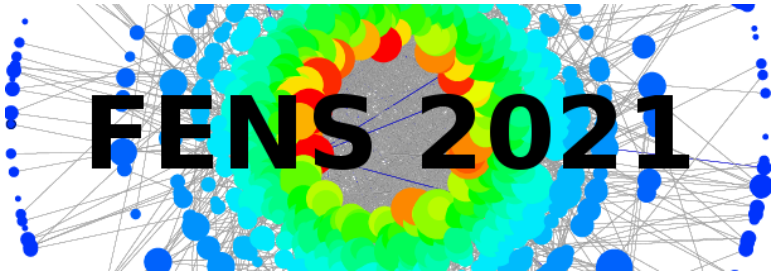

Contribution ID: **16** Type: **Contributed talk (20 min)**

Noisy voter model of the parliamentary attendance data

Thursday, 1 July 2021 17:20 (20 minutes)

We examine parliamentary attendance data of the 2008–2012, the 2012–2016 and the 2016–2020 legislatures of Lithuanian parliament. In our exploration of the data set we consider cumulative attendance series of the representatives in the parliament as individual traces of the particles. In this scenario we observe that empirical series exhibit superdiffusive behavior. Similar observation was previously made by Vieira and others [1] in the Brazilian parliament attendance data.

We modify the well-known noisy voter model to allow reproduction of the attendance data. Namely, we assume the two states in the model to correspond to intention to attend or to skip the next session. We find that if the intentions are perfect (always result in the intended action), then the noisy voter model reproduces either normal diffusive behavior (if independent behavior dominates) or ballistic regime (if herding behavior dominates). Superdiffusive behavior can be observed only if the intentions are imperfect and only for a relatively narrow range of parameters (corresponding to a balance between independent and herding behavior).

We were able to find parameter set of the model [2], which matches anomalous diffusion observed in Lithuanian data reasonably well. To further verify similarity between the empirical and simulated data, we also compare the distributions of the presence and absence streaks.

1. D. S. Vieira et al., PRE 99: 042141 (2019). doi:10.1103/PhysRevE.99.042141.
2. A. Kononovicius, J. Stat. Mech. 2020: 063405 (2020). doi: 10.1088/1742-5468/ab8c39.

Primary author: KONONOVICIUS, Aleksejus (Institute of Theoretical Physics and Astronomy, Vilnius University)

Presenter: KONONOVICIUS, Aleksejus (Institute of Theoretical Physics and Astronomy, Vilnius University)

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