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Noisy Voter Model with time-varying influencers

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MOTIVATION

Influence marketing



Enrolling of influencial people by a brand in the aim to change the buying habits of consumers

What happens if the influencers switch the endorsed brand ?

THE MODEL

Voters of two types in an all to all connection that can **choose** between brand **A** and **B**

N normal voters: change opinion by imitating another voter, with an **herding parameter** *h* and at **random**, with a **noise constant** *a*

αN Influencers:







change opinion all together and only at random, with a **switching rate** λ

Will there be a preferred brand?

To answer this question we studied the model in two different limit cases

FAST SWITCHING INFLUENCERS

For an infinitely fast switching group of influencers:

 $\lambda
ightarrow \infty$ we obtain a **noisy Voter Model** but for a population of size

> $\tilde{N} = \frac{N}{1+\alpha}$ and noise constant

Fraction of influencers choosing A

fraction of normal agents choosing A

LARGE POPULATION OF VOTERS

For a large population size $N \gg 1$

we obtain a **phase transition** from a **bimodal** to a **unimodal** shape of the stationary distribution of normal voters choosing A



0.8

1.0





0.0

BIMODAL

0.2

(intermittent preference)

0.4

0.6

α

