

Peer commentary on Wolfgang Banzhaf's "genetic programming and emergence"

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Welcome to the first instance of a new feature of *Genetic Programming and Evolvable Machines*: a "peer commentary" special section.

This special section includes a "target article," commentaries on the target article, and a response to the commentaries by the target article's author.

The editorial process for peer commentary sections in *Genetic Programming and Evolvable Machines* was developed in part through discussions at the 2012 meeting of the editorial board and was subsequently refined in further discussions among the journal's editors.

The purpose of a peer commentary special section in *Genetic Programming and Evolvable Machines* is to present lively, curated, informed and substantive discussion of important issues in the field. We are particularly interested in discussion of issues about which we expect there to be differing views in the community. To this end, the process is open to commentaries that support or criticize a target article, by members of the editorial board and their invitees. All commenters must agree to treat the target article as confidential prior to publication.

The target article for our inaugural peer commentary special section was graciously provided by Wolfgang Banzhaf, a leading thinker in our field and the founding editor of this journal. Professor Banzhaf has taken on a difficult and important topic concerning the nature of "emergence" in the study of complex systems and across the sciences more generally. He briefly surveys the historical context of the concept of emergence, explains emergence in terms of causal relations among hierarchically-organized entities, and makes the case that genetic

This editorial refers to the articles available at the following doi's: [10.1007/s10710-013-9196-7](https://doi.org/10.1007/s10710-013-9196-7); [10.1007/s10710-013-9198-5](https://doi.org/10.1007/s10710-013-9198-5); [10.1007/s10710-013-9199-4](https://doi.org/10.1007/s10710-013-9199-4); [10.1007/s10710-013-9200-2](https://doi.org/10.1007/s10710-013-9200-2); [10.1007/s10710-013-9201-1](https://doi.org/10.1007/s10710-013-9201-1); [10.1007/s10710-013-9202-0](https://doi.org/10.1007/s10710-013-9202-0); [10.1007/s10710-013-9203-z](https://doi.org/10.1007/s10710-013-9203-z); [10.1007/s10710-013-9204-y](https://doi.org/10.1007/s10710-013-9204-y) and [10.1007/s10710-013-9207-8](https://doi.org/10.1007/s10710-013-9207-8).

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programming systems produce a wealth of emergent phenomena that can be studied and harnessed.

Seven members of the editorial board (Lee Altenberg, Anikó Ekárt, Krzysztof Krawiec, André Leier, David Montana, Moshe Sipper, and Peter A. Whigham) provided commentaries, and while most of their comments were sympathetic to the target article's thesis, several also contained thoughtful challenges. Professor Banzhaf's thorough responses to the commentaries add depth and detail to his original analysis.

I hope that you will find the exchange between Professor Bahzhaf and his commentators engaging and stimulating, and that you will join me in looking forward to additional peer commentary sections in *Genetic Programming and Evolvable Machines* in the future.

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