

## Detecting novel associations in large data sets.

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Abstract	<p>Identifying interesting relationships between pairs of variables in large data sets is increasingly important. Here, we present a measure of dependence for two-variable relationships: the maximal information coefficient (MIC). MIC captures a wide range of associations both functional and not, and for functional relationships provides a score that roughly equals the coefficient of determination (<math>R^2</math>) of the data relative to the regression function. MIC belongs to a larger class of maximal information-based nonparametric exploration (MINE) statistics for identifying and classifying relationships. We apply MIC and MINE to data sets in global health, gene expression, major-league baseball, and the human gut microbiota and identify known and novel relationships.</p>
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- [3] <https://turnbaughlab.ucsf.edu/Papers?f%5Bauthor%5D=826>
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- [5] <https://turnbaughlab.ucsf.edu/Papers?f%5Bauthor%5D=836>
- [6] <https://turnbaughlab.ucsf.edu/Papers?f%5Bauthor%5D=6>
- [7] <https://turnbaughlab.ucsf.edu/Papers?f%5Bauthor%5D=841>
- [8] <https://turnbaughlab.ucsf.edu/Papers?f%5Bauthor%5D=846>
- [9] <https://turnbaughlab.ucsf.edu/Papers?f%5Bauthor%5D=851>
- [10] <https://turnbaughlab.ucsf.edu/Papers?f%5Bkeyword%5D=626>
- [11] <https://turnbaughlab.ucsf.edu/Papers?f%5Bkeyword%5D=1>
- [12] <https://turnbaughlab.ucsf.edu/Papers?f%5Bkeyword%5D=821>
- [13] <https://turnbaughlab.ucsf.edu/Papers?f%5Bkeyword%5D=826>
- [14] <https://turnbaughlab.ucsf.edu/Papers?f%5Bkeyword%5D=181>
- [15] <https://turnbaughlab.ucsf.edu/Papers?f%5Bkeyword%5D=831>
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- [17] <https://turnbaughlab.ucsf.edu/Papers?f%5Bkeyword%5D=301>
- [18] <https://turnbaughlab.ucsf.edu/Papers?f%5Bkeyword%5D=86>
- [19] <https://turnbaughlab.ucsf.edu/Papers?f%5Bkeyword%5D=256>
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- [21] <https://turnbaughlab.ucsf.edu/Papers?f%5Bkeyword%5D=96>
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