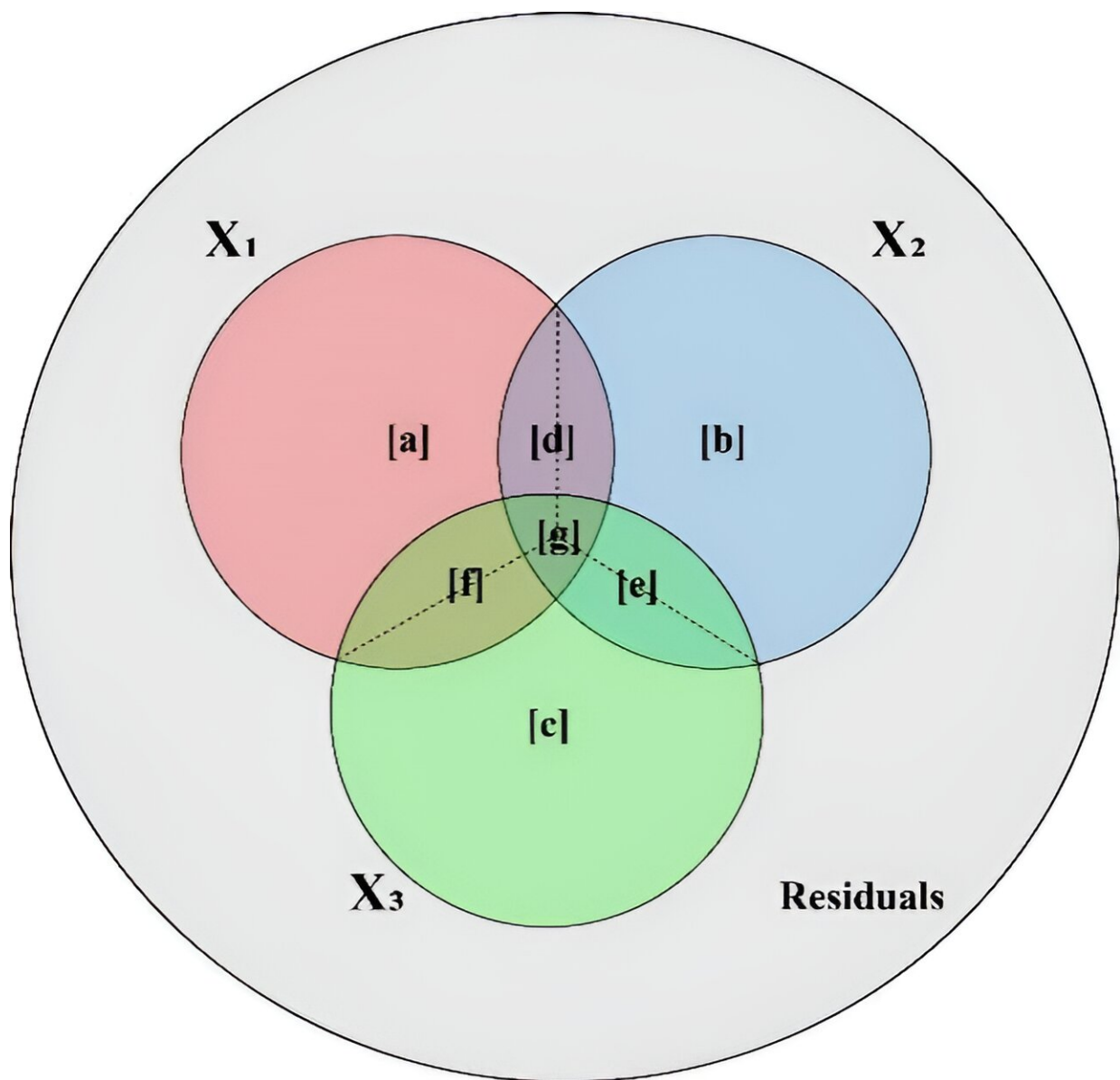# PHYS.ORG

Free software tool evaluates relative importance of predictors in generalized additive models

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The Venn diagram illustrates the distribution of variation components within a Generalized Additive Model. Credit: Jiangshan Lai, et al.,

Generalized additive models (GAMs) are commonly used in ecological research for their ability to model complex nonlinear relationships. However, assessing predictor importance in the presence of concurvity is difficult due to overlapping variance among predictors.

To that end, a team of researchers from Nanjing Forestry University and Guangzhou Climate and Agro-meteorology Center in China created a new computer software package that calculates individual R^2 values for predictors based on the concept of "average shared variance," a method previously introduced for multiple regression and canonical analyses.

"This newly developed gam.hp R package calculates individual R^2 values for predictors in GAMs based on the 'average shared variance' concept," says Jiangshan Lai, lead and co-corresponding author of the study. " It allows for the equitable distribution of shared R^2 among related predictors, providing a measure of each predictor's unique and shared contribution to the model's fit."

Notably, the gam.hp R package is free to use, with the details published in the journal *Plant Diversity*.

The authors demonstrate the utility of gam.hp R package by analyzing air quality data in London, specifically looking at the relative importance of emission sources and meteorological factors in explaining ozone concentration variability.
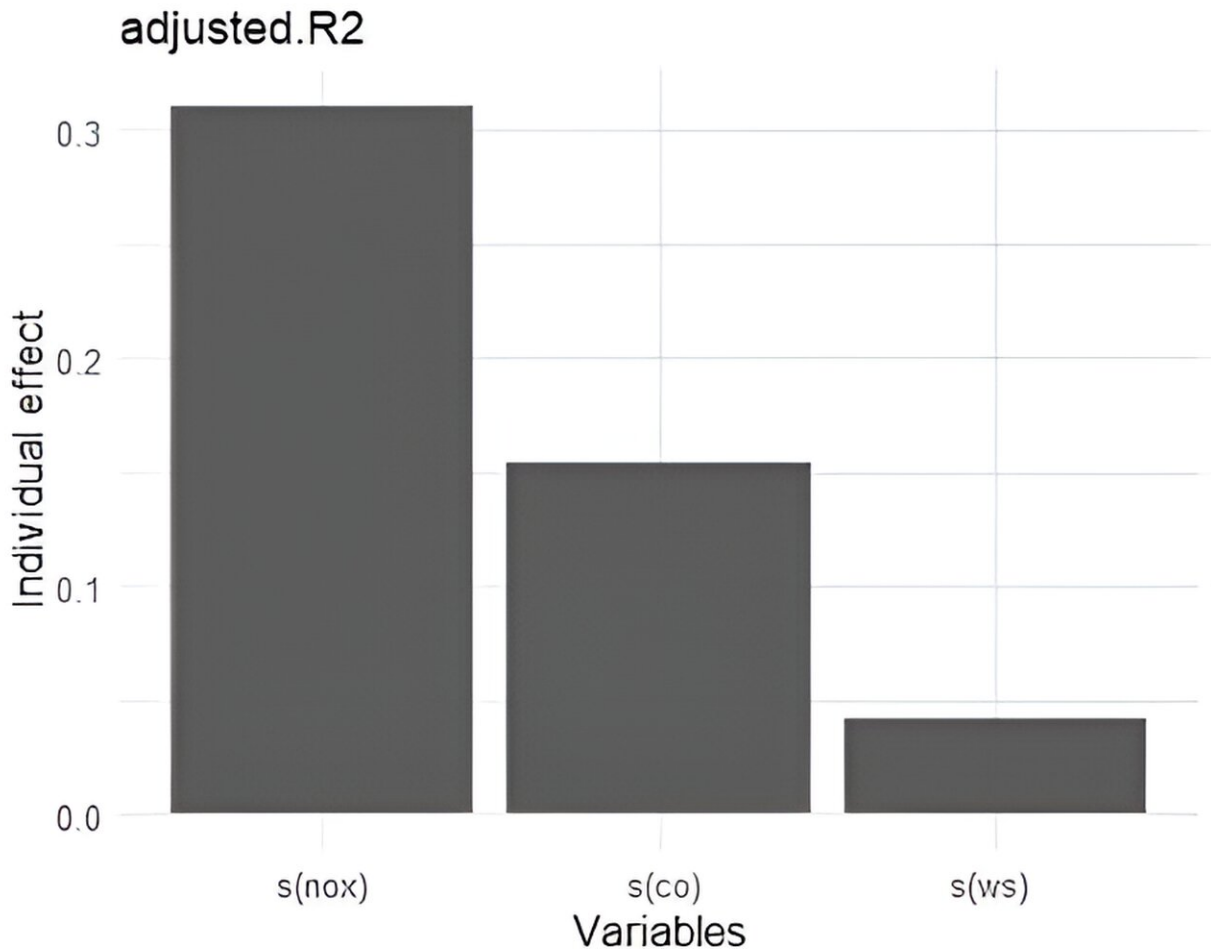
The relative importance of individual smoothed variables in explaining ozone concentration variability by *gam.hp.*. Credit: Jiangshan Lai, et al.,

"The findings recommend prioritizing the control of NO_x emissions during ozone pollution episodes in London, followed by efforts to reduce CO emissions and enhance the accuracy of wind speed (WS) forecasts," explains Lai.

This [methodology](#) supports the formulation of more refined and effective strategies for ozone pollution control by government bodies,

considering various influencing factors.

"We would like to see more researchers incorporate the gam.hp package into their studies. Use this package if its outcome meets your analytical expectations; otherwise, its usage is not mandatory," says Lai.