

UCLA

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A regression tree model to identify the effect of nanoparticles physiochemical properties on their toxicity

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3:30pm - 4:30pm, CHS 33-105A

Refreshments served at 3:00 PM in room 51-254 CHS

ABSTRACT: The increasing use of engineered nanomaterials (ENM) has recently raised concern about their potential environmental hazard. Currently, there is a growing interest in developing models to relate physiochemical characteristics of ENM, such as size or dissolution rate, to their toxicity profile, measured by high throughput screening across multiple doses and times of exposure. We propose a new model that combines regression trees to account for non-linear and interaction effects of ENM properties, and P-splines for flexible smoothing of dose and time-response surfaces. This model is adapted to low sample sizes and avoids loss of information by combining all measurements from a high-throughput experiment. It also provides a number of parameters of interest for toxicologists, such as the importance of physiochemical properties and their marginal effect on toxicity. We illustrate our method on simulated data and on a library of 24 metal oxides.