

Environmental health webtool development



Dhruvilkumar Ashokbhai Chodvadiya^{1,2}, Shashwat Dhayade^{1,3}, Feng Gao^{4,5}, Yike Shen¹

¹Department of Earth and Environmental Sciences, University of Texas at Arlington

²Department of Computer Science and Engineering, University of Texas at Arlington

³Department of Data Science, University of Texas at Arlington

⁴Department of Environmental Health Sciences, University of California, Los Angeles

⁵Department of Molecular and Medical Pharmacology, University of California, Los Angeles

dac6360@mavs.uta.edu; yike.shen@uta.edu



Introduction

Background:

- Environmental health sciences are rapidly evolving with cohort studies generating extensive data on exposures, omics, and disease outcomes. Traditional static knowledge graphs summarize these data but require manual searching for linked publications, reducing efficiency.
- There is a growing demand for interactive tools that allow dynamic exploration and direct access to source publications. In parallel, many ML models for toxicity prediction require Python coding, making them inaccessible to non-technical users.

Motivations for webtools

Current Challenges:

- Static Visualizations:** Traditional graphs require manual sifting to find linked publications.
- Accessibility Barriers:** ML toxicity models often demand Python expertise, limiting use by regulatory agencies and interdisciplinary researchers.

Our Solutions:

- Interactive Knowledge Graph** (cohortnetwork.org): Allows users to click on nodes and edges to immediately access relevant publications.
- User-Friendly ML Prediction** (ecotoxicity.org): Provides a web-based interface for toxicity prediction that bypasses the need for programming.

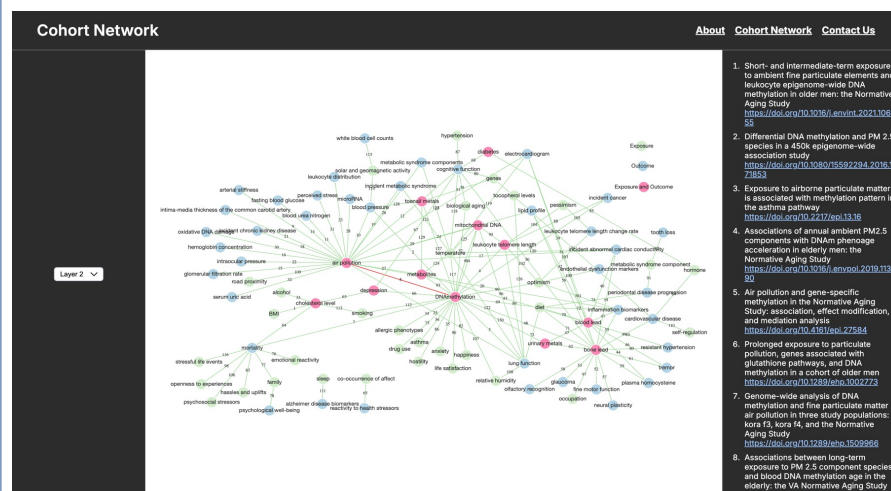


Ecotoxicity Prediction



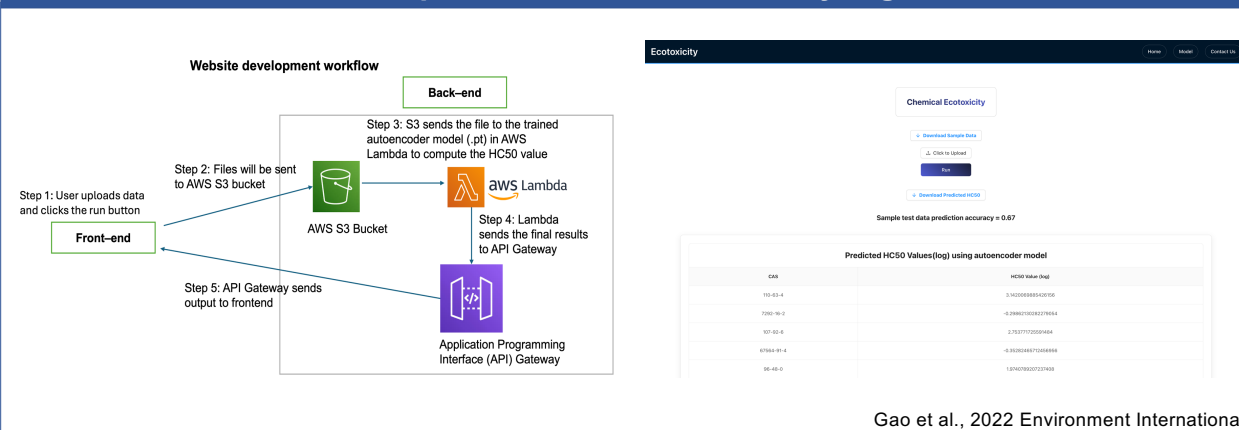
Interactive Knowledge Graph

Interactive knowledge graph, cohortnetwork.org



Shen et al., 2023 Environmental Science & Technology

ML prediction tool, ecotoxicity.org



Gao et al., 2022 Environment International

Acknowledgement: College of Science Research Innovation Award; University of Texas Rising STARs award