In this thesis, we utilize the discrete-state-in-continuum model and projection operator formalism, successfully used to describe inelastic electron-molecule collisions, to model resonant electron photodetachment. An integral part of this work is the development of numerical methods that enable the quantitative evaluation of resonant electron photodetachment. Additionally, we seek analogs in photodetachment physics to phenomena observed in electron-molecule collisions, such as boomerang oscillations. The study utilizes these methods on simplified diatomic molecule models, particularly inspired by LiH and N_2 molecules. The findings suggest the potential for extending these numerical methods to more complex molecular systems in future research.