

## Guidelines for Writing Abstracts

### 1. Abstract Components

- Motivation and Problem Statement
  - Why do we care about the problem?
  - What problem are you trying to solve/review?
- Approach and Results
  - How did you go about solving or reviewing the problem?
  - Did you use simulation, analytic models, or prototype construction?
  - What are the most significant results?
- Impact
  - What are the implications of the results?

### 2. Examples of Abstracts

#### *Exposure to hydrocarbons while commuting by bicycle in Chicago*

Health researchers have recognized through various studies that automobile emissions present hazards for pedestrians in close proximity to exhaust outlets on vehicles. However, no analogous analysis has been done on another potential vulnerable population, that of bicycle riders. In order to determine the impact of emissions, this study tested hydrocarbon exposures by catching air samples in small vacuum canisters worn by commuting bicyclists. Heart and respiration rates for individual cyclists were recorded, as well as journey length. Contemporaneous air samples were also taken in a variety of locations throughout the Chicago metro area. The samples were then analyzed for the presence of several automobile produced hydrocarbons, including benzene and acetylene. The cyclists inhaled higher levels of hydrocarbons than the average amount present at the sample air collection locations in the Chicago metro areas, ranging from 25 ppm – 250 ppm higher, depending upon the hydrocarbon tested. The results of this study indicate that bicyclists studied were heavily impacted by automobile emissions. This should be seriously considered in future placement of bicycle paths in urban areas

Example from [Purdue Science](#)

#### ***A Scalable Parallel Algorithm for Solving Parabolic Partial Differential Equations*** ***Wilson Rivera and Jianping Zhu***

When solving parabolic partial differential equations on parallel computers using non-overlapping domain decomposition methods, one often needs numerical boundary conditions on the boundaries between subdomains. These numerical boundary conditions can significantly affect the stability and accuracy of the final algorithm. In this paper, a stability and accuracy analysis of the existing methods for generating numerical boundary conditions will be presented, and a new approach based on explicit predictors and implicit correctors will be discussed. Both theoretical analyses and numerical results demonstrate significant improvement in stability, accuracy, and scalability by using the new approach