

# DIMACS

Center for Discrete Mathematics &  
Theoretical Computer Science



## DIMACS EDUCATIONAL MODULE SERIES

### MODULE 07-2

### Rehabilitating after a Forest Fire

### Voronoi Diagrams and Scheduling Algorithms

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## Module Description Information

- **Title:**

Rehabilitating after a Forest Fire  
Voronoi Diagrams and Scheduling Algorithms

- **Authors:**

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- **Abstract:**

Students are introduced to a problem involving scheduling crews to rehabilitate a forest after a fire. Initial discussion of the problem gives way to a guided exploration of Voronoi diagrams and some potential use of Geometer's Sketchpad. Scheduling algorithms involving priority lists are considered as a means of solving the problem.

- **Informal Description:**

This module uses the pedagogical technique of "guided design" to direct students through a solution to a multi-step problem involving Voronoi diagrams and scheduling. Problem solving techniques and stamina should be developed. The module provides a venue to improve group process and communication skills. Individuals printing this module will need a color printer.

- **Target Audience:**

The module is designed for sophomore and junior students in courses such as Discrete Mathematics, Geometry or Mathematical Modeling.

- **Prerequisites:**

The only required background is high school geometry. We use theorems related to perpendicular bisectors and circumcircles of triangles along with basic terminology from graph theory (vertex, edge). It would be helpful, but not mandatory, if instructors have had some experience with scheduling algorithms involving prerequisites and priority lists. A reference for scheduling algorithms is listed.

- **Mathematical Fields:**

Planar Geometry, Discrete Mathematics.

- **Applications Areas:**

This module addresses Voronoi diagrams and a schedule algorithm.

- **Mathematics Subject Classification**

68U05, 90B50

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- **Other DIMACS modules related to this module:**  
None