PART I - PROJECT IDENTIFICATION INFORMATION

1. Program Official/Org.  Thomas J. Hodgson - DDM

2. Program Name  OPERATIONS RESEARCH & PRODUCTION SYSTEMS

3. Award Dates (MM/YY)  From: 07/85  To: 12/90

4. Institution and Address  Georgia Tech Research Corp
                          Administration Building
                          Atlanta  GA  30332

5. Award Number  8451032

6. Project Title  Presidential Young Investigator: Computational Complexity and Rescheduling Algorithms

This Packet Contains
NSF Form 98A
And 1 Return Envelope
The project centered on two topics: the development and analysis of heuristics and algorithms for scheduling and related optimization problems; and the interdisciplinary application of computational complexity and related techniques. For the first topic, findings include effective heuristic methods and improved complexity classification for scheduling and routing problems in satellite data processing, circuit card assembly, classroom assignment, and multiprocessing, as well as contributions to the development and analysis of generic techniques: simulated annealing, local improvement, linear programming, augmenting paths, and dynamic programming on recursive graphs. For the second topic, two areas were studied: social choice, and honey bee foraging. In social choice, principal results include construction of a voting procedure that employs computational complexity to thwart manipulation; convergence results and polynomial algorithms for the yolk, minimax set, and other solution concepts. The asymptotic consistency of sample estimators and associated computational methods help form the basic tools needed for empirical study of social choice. The study of honey bees produced a model predicting the pattern and quality of forager allocation among flower patches. Preliminary experimental data support the model.
Publications Resulting from this Award
References


The data requested below are important for the development of a statistical profile on the personnel supported by Federal grants. The information on this part is solicited in response to Public Law 99-383 and 42 USC 1885C. All information provided will be treated as confidential and will be safeguarded in accordance with the provisions of the Privacy Act of 1974. You should submit a single copy of this part with each final project report. However, submission of the requested information is not mandatory and is not a precondition of future award(s). Check the “Decline to Provide Information” box below if you do not wish to provide the information.

Please enter the numbers of individuals supported under this grant.
Do not enter information for individuals working less than 40 hours in any calendar year.

<table>
<thead>
<tr>
<th>Category</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Senior Staff</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Post-Doctorals</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Graduate Students</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Under-Graduates</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other Participants</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. Total, U.S. Citizens</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>B. Total, Permanent Residents</td>
<td></td>
<td></td>
</tr>
<tr>
<td>U.S. Citizens or Permanent Residents</td>
<td></td>
<td></td>
</tr>
<tr>
<td>American Indian or Alaskan Native</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asian</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black, Not of Hispanic Origin</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hispanic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pacific Islander</td>
<td></td>
<td></td>
</tr>
<tr>
<td>White, Not of Hispanic Origin</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>C. Total, Other Non-U.S. Citizens</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Specify Country</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. PR China</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>2. Israel</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D. Total, All participants (A + B + C)</td>
<td>6</td>
<td>3</td>
</tr>
</tbody>
</table>

Disabled

---

1 Category includes, for example, college and precollege teachers, conference and workshop participants.
2 Use the category that best describes the ethnic/racial status for all U.S. Citizens and Non-citizens with Permanent Residency. (If more than one category applies, use the one category that most closely reflects the person's recognition in the community.)
3 A person having a physical or mental impairment that substantially limits one or more major life activities; who has a record of such impairment; or who is regarded as having such impairment. (Disabled individuals also should be counted under the appropriate ethnic/racial group unless they are classified as "Other Non-U.S. Citizens.")

AMERICAN INDIAN OR ALASKAN NATIVE: A person having origins in any of the original peoples of North America, and who maintain cultural identification through tribal affiliation or community recognition.
ASIAN: A person having origins in any of the original peoples of East Asia, Southeast Asia and the Indian subcontinent. This area includes, for example, China, India, Indonesia, Japan, Korea and Vietnam.
BLACK, NOT OF HISPANIC ORIGIN: A person having origins in any of the black racial groups of Africa.
HISPANIC: A person of Mexican, Puerto Rican, Cuban, Central or South American or other Spanish culture or origin, regardless of race.
PACIFIC ISLANDER: A person having origins in any of the original peoples of Hawaii; the U.S. Pacific Territories of Guam, American Samoa, or the Northern Marianas; the U.S. Trust Territory of Palau; the islands of Micronesia or Melanesia; or the Philippines.
WHITE, NOT OF HISPANIC ORIGIN: A person having origins in any of the original peoples of Europe, North Africa, or the Middle East.

NSF Form 98A (Rev. 10/90)