Maple Scholars Program

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Abstract

The author has mentored undergraduate research projects at five institutions funded by a variety of internal and external sources both during the summer and during the academic year. Unique to his experience, the Goshen College Maple Scholars Program places an emphasis on communication across disciplines. During the eight-week summer program funded by the college, 12-20 students share a common residential space and work on scholarly projects mentored by individual faculty in any discipline. This much is typical for summer research programs. What is different is the encouragement for students to visit each others' research groups: literary critics see how biologists are trying to efficiently produce algae for biofuels while chemists try playing musical instruments being designed by physicists. During their weekly talks, students try to make their scholarly progress clear to students and faculty in other disciplines. Mathematicians suggest logistics that may make an inside-outside prison exchange possible while theologians ask how a fair division characterization theorem might apply to a local dilemma. A former math major can be involved in collecting local women's stories that are integrated into a dramatic script, and a computer science major can help create a web based data base housing stories of the Mara region of Tanzania. This talk will describe the Maple Scholars Program and compare its goals and outcomes to other undergraduate research programs in which the author has participated.
What will you do with your wild and precious summer?
Maple Scholars 2003
An interdisciplinary community dedicated to empowering leadership through communications across boundaries, building successful relationships fostering understanding through constructive communication across disciplines creating a culture for service attitude by reaching beyond the ordinary into the uncommon and striving to embrace a superior standard of academic achievement and fair division consistent both with the “Confession of Faith in a Mennonite Perspective” “Standards for Guiding Our Lives Together” and every other capricious whim of our fearless leader including but not limited to ...
Maple Scholars Program Features

- Institutionally funded
- Close interaction between one faculty mentor and one or two Goshen College students for eight weeks
- Project design often has significant student input
- Weekly seminars
  - faculty once and each student three times
  - ten minute time limit
  - Interdisciplinary questions and discussion
- Community living, social interaction, and tee shirts
- Intergroup visitation
- Celebration!
- Dissemination
- Outcomes
Maple Scholars 2003

• Kaleab Abebe, A Maximally Equitable Solution in Fair Division with \( n \) Players
• Rachelle Ramer, Convexity of Partially Defined Cooperative Games
• Andrew Histand, The Range Nucleolus for Cooperative Games

Kaleah, Cholly, and Stan, if you would just cut him into thirds, everything would be fair.
\( X_{ei} \) = vote of justice \( i \) on case \( c \) (0=mmb, 1=mmb) 

\( \bar{X}_i \) = ave of justice \( i \)'s vote

\( f_{ck} \) = value of factor \( k \) on case \( c \)

Model:
\[
X_i - \mu_i = L_{i1} F_1 + L_{i2} F_2 + L_{i3} F_3 + \varepsilon_i
\]

\[
\min \sum_{i=1}^{9} \left( \frac{(X_{ci} - \bar{X}_i - L_{i1} F_1 - L_{i2} F_2 - L_{i3} F_3)^2}{\gamma_i} \right) = (f_1, f_2, f_3)
\]

\[ \sum \text{Princamp proc} \]

Psych | Principal | Fastaval

rule = "none"

"Vanilla"

\( X_c = \varepsilon_c \)

\[ f_d \]

\[ \text{Opt} \]

\[ \text{Opt} \]

\[ \text{Opt} \]

\[ \text{Opt} \]
Maple Scholars Friday Seminar
What is Woody Perennial Polyculture

- Woody (e.g. trees, shrubs)
- Herbaceous (e.g. grasses, forbs)
- Perennial:
  - individuals return every year
- Annual:
  - individuals must be reseeded each year
- Polyculture:
  - multiple species growing together
- Monoculture:
  - one species dominates large area
... and Other Conferences
Evolutionary Relationships in Hymenoptera

Abstract

The genes of an ancient lineage within the order Hymenoptera have been shown to be well conserved. This conservation is thought to be due to their role in morphological differences between species. In order to better understand the evolutionary relationships among these species, a phylogenetic analysis was conducted. The results of this analysis were used to further investigate the morphological differences among species.

Methods

A phylogenetic tree was constructed using the software Phylogenetic Analysis and Classification. The tree was based on the sequences of the target genes from 10 different species. The tree was then used to construct a phylogenetic analysis of the morphological differences among species.

Results

The results of the phylogenetic analysis showed that the species are grouped into three distinct clusters. Each cluster contains species that are similar in their morphological characteristics. These results are consistent with the results of the morphological analysis.

Discussion

The results of the phylogenetic analysis support the hypothesis that the morphological differences among species are due to differences in the sequences of the target genes. Further study is needed to confirm these results.

References


Maple Scholars Celebration!
Maple Scholars Celebration!
## Per Student Finances

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<tr>
<td>Student Stipend</td>
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<td>Housing</td>
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<td>Total</td>
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- About 8 student positions are funded school-wide.
- Merry Lea Environmental Center, Witmer Funds, Turner Labs, various departments, and the MAA SUMMA program have funded additional students.
Maple Scholars Timeline

- Oct: Faculty apply
- Nov: Decisions made
- Feb: Students apply
- Mar: Decisions made
- Jun 1: Picnic
- Jun 2 & 6: Faculty talks
- Daily meetings
- Jun 13, 20, 27; Jul 3, 11, 18: Student talks
- Jul 23: Indiana Math REU Meeting
- Jul 24: Celebration
Outcomes

  - 26 students
  - 12 PhDs (7 in math, 2 econ, comp sci, bioengineering, public affairs)
  - 3 masters degrees (math, operations research, & economics)
  - at least 5 others started graduate study.

- Maple Scholars (1999-2014)
  - 22 students (18 mine)
  - 5 have just graduated or are still undergraduates
  - 2 PhDs (operations research, statistics)
  - 1 masters (architecture)
  - 3 PhD students (mathematics, physics, computer & cognitive sciences)
  - Careers of the other students include
    - software engineer
    - free-lance actor
    - psychiatric nurse
    - community medical clinic administrator
    - desktop architecture specialist
    - author
    - farmer
    - wine consultant
For More Information

• Maple Scholars Program
  • http://www.goshen.edu/maplescholars/

• My Students
  • http://people.goshen.edu/~dhousman/ugresearch/ugresearch_complete.htm

• Me
  • www.goshen.edu/dhousman
  • dhousman@goshen.edu