

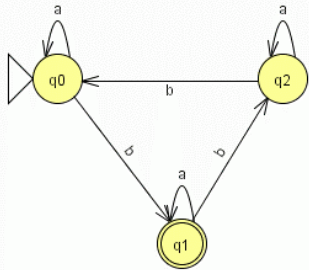
# A Hands-on Approach to FLA with JFLAP

## Wrap Up

Susan Rodger, Duke University

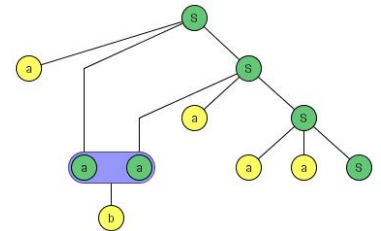
Thomas Finley, Cornell University

Peter Linz, University of California, Davis



SIGCSE 2006

March 4, 2006



# Wrap-up

- Fitting JFLAP into a Course
- What Students think of JFLAP
- JFLAP's usage
- JFLAP NSF Sponsored Study

# How JFLAP Fits Into Topics In Formal Languages Course Summary

- JFLAP 3.1 covers 4 chapters of material spread out over 6 chapters.
- JFLAP 4.0 covers 9 chapters of material spread out over 11 chapters.

## How JFLAP Fits Into Topics

Topic	JFLAP 3.1	JFLAP 4.0
Finite Automata	1	1
Regular Grammars/Expressions	$\frac{3}{4}$	1
Properties of Regular Languages		$\frac{1}{2}$
Context-Free Grammars	$\frac{1}{2}$	1
Simplify CFL		1
Pushdown Automata	1	1
Properties of CFL		
Turing Machine (1-Tape)	$\frac{1}{2}$	$\frac{3}{4}$
Other Models of TM	$\frac{1}{4}$	$\frac{1}{2}$
Recur. Enumerable Languages		$\frac{1}{4}$
LL and LR Parsing		1
L-Systems		1

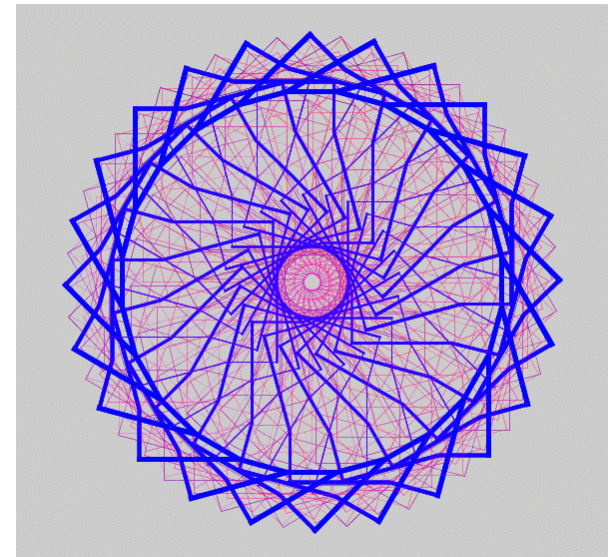
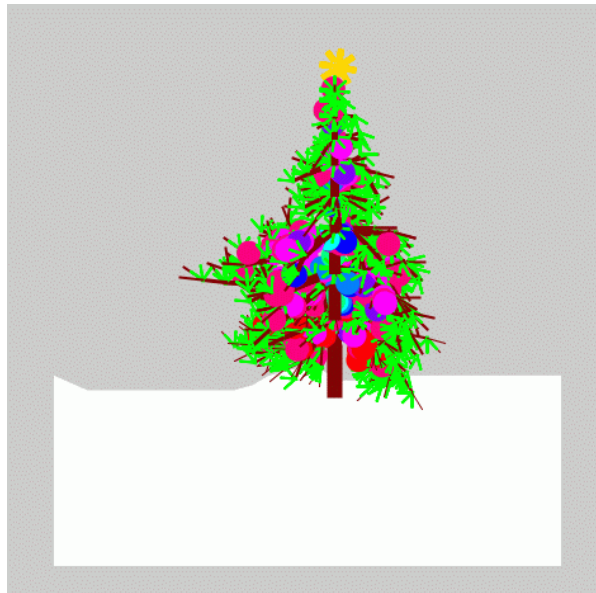
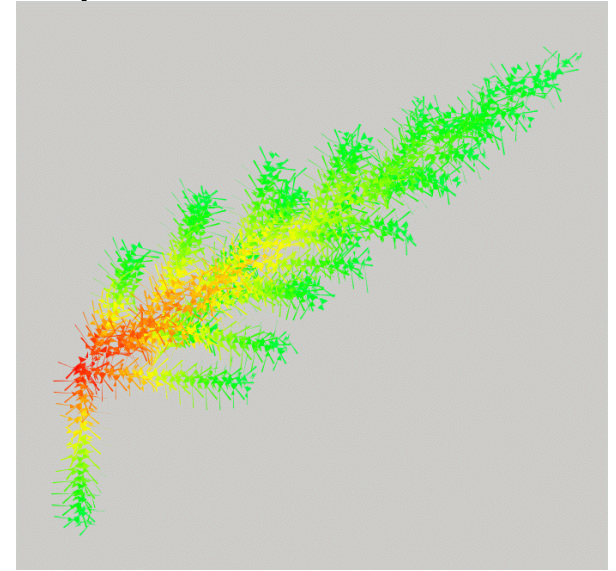
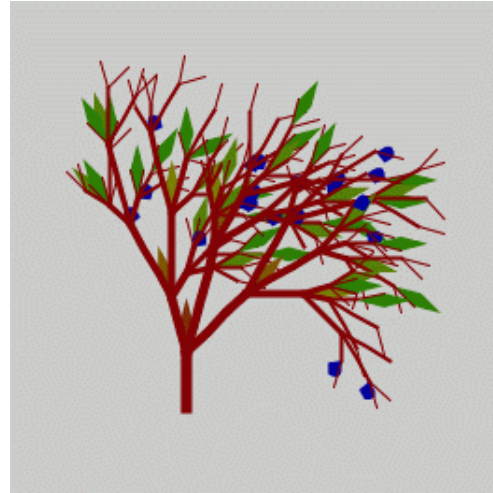
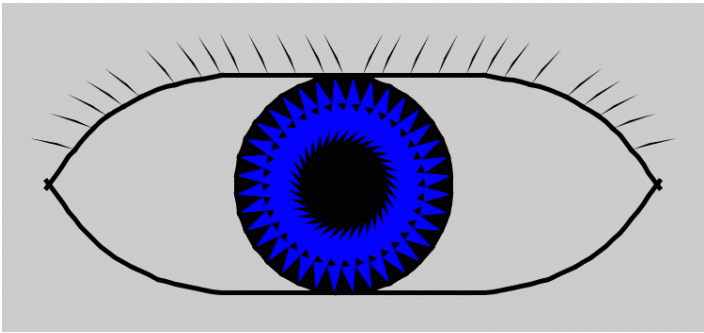
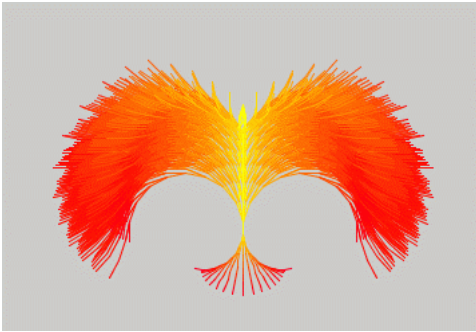
# Feedback – CPS 140 – Spring 2003

- Used JFLAP and tools in 6 of 9 homeworks
- Questionnaire – 33 responses
  - “Was JFLAP easy to use?” All 33 yes
  - “Did you look at the help at all? If so, what part did you look at and was it helpful?” 6 found it helpful, 27 didn’t look
  - “Do you prefer creating FA using JFLAP or drawing them on paper?”
    - 17 students – prefer to use JFLAP
    - 12 students – prefer paper first, then JFLAP for testing
    - 2 students – prefer paper

# Comparison of Duke CPS 140

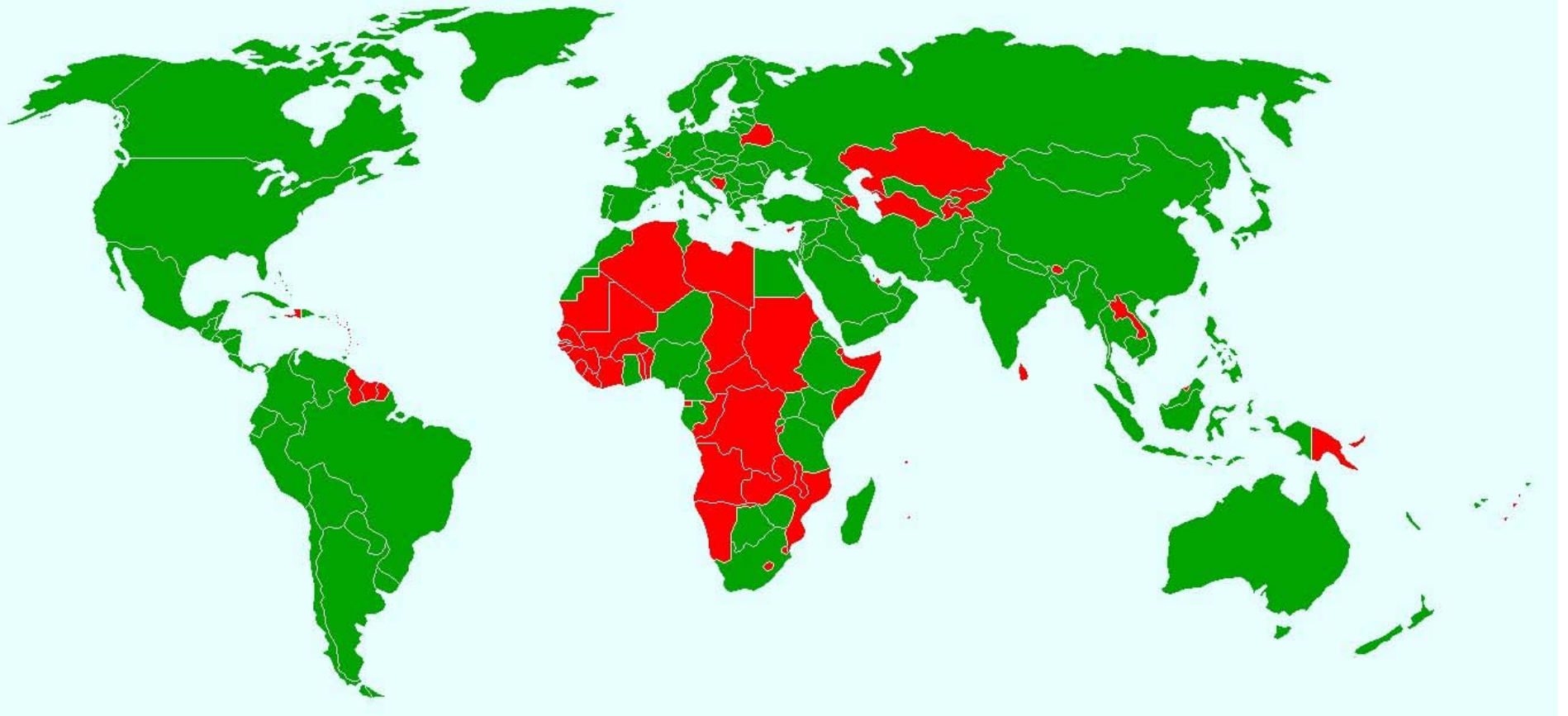
- Spring 2003
  - 6 of 9 homeworks had JFLAP on them
- Spring 2005
  - 10 of 11 homeworks had JFLAP on them

# Students like L-systems



# JFLAP's Use Around the World

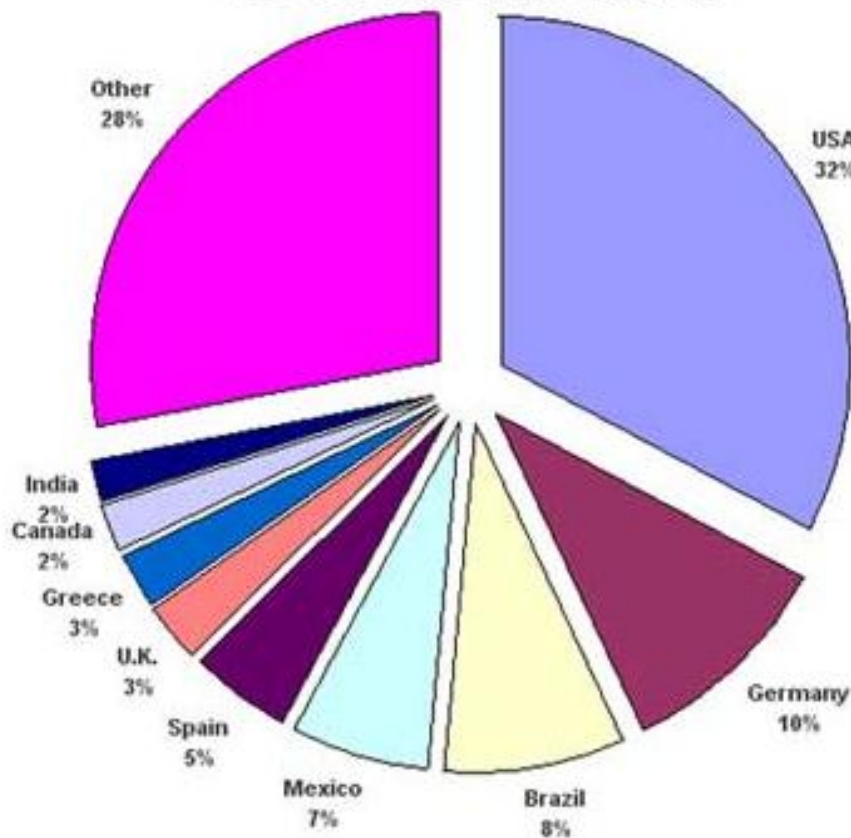
- Downloaded from 124 countries (green), over 25,000 downloads since Jan 2003





# JFLAP's Use Around the World

## User Distribution



## Required?

No	8999
Yes	8391
N/A	7931
Total:	25321

## Reason For Usage

Taking Course	11704
Teaching Course	3429
Research	1607
Other	1593
N/A	6988
Total:	25321

# JFLAP's Use Around the World

- JFLAP web page has over 70,000 hits since 1996
- Google Search
  - JFLAP appears on over 13,000 web pages
  - Note: search only public web pages

# JFLAP on web pages

- Course web pages

**CSE 354 Automata Theory and Formal Languages ( Fall 2004 )**

**Computer Science 60  
Principles of Computer Science  
Spring 2005**

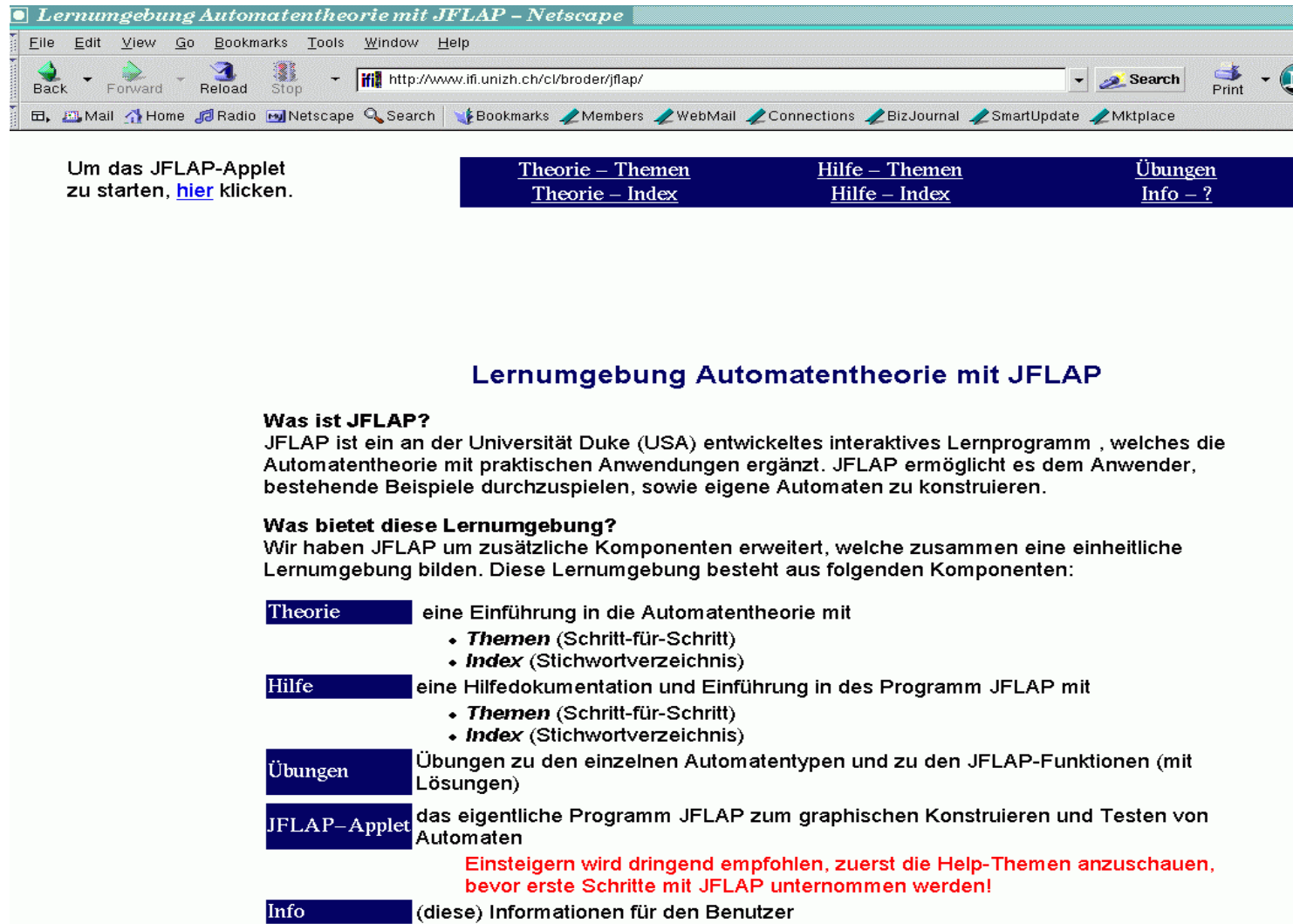
**03-60-214: Computer Languages, Grammars and Translators**

**(Winter 2006)**

- Blogs

[JFLAP](#). Discovered through Alex Nelson. An awesome learning tool for the creation and simulation of DFAs, NFAs, CFGs, Turing machines, and L-systems. This would have been so useful to discover last quarter.

# JFLAP in German



Um das JFLAP-Applet zu starten, [hier](#) klicken.

[Theorie – Themen](#)      [Hilfe – Themen](#)      [Übungen](#)  
[Theorie – Index](#)      [Hilfe – Index](#)      [Info – ?](#)

## Lernumgebung Automatentheorie mit JFLAP

**Was ist JFLAP?**  
JFLAP ist ein an der Universität Duke (USA) entwickeltes interaktives Lernprogramm , welches die Automatentheorie mit praktischen Anwendungen ergänzt. JFLAP ermöglicht es dem Anwender, bestehende Beispiele durchzuspielen, sowie eigene Automaten zu konstruieren.

**Was bietet diese Lernumgebung?**  
Wir haben JFLAP um zusätzliche Komponenten erweitert, welche zusammen eine einheitliche Lernumgebung bilden. Diese Lernumgebung besteht aus folgenden Komponenten:

<b>Theorie</b>	eine Einführung in die Automatentheorie mit <ul style="list-style-type: none"><li>• <b>Themen</b> (Schritt-für-Schritt)</li><li>• <b>Index</b> (Stichwortverzeichnis)</li></ul>
<b>Hilfe</b>	eine Hilfedokumentation und Einführung in des Programm JFLAP mit <ul style="list-style-type: none"><li>• <b>Themen</b> (Schritt-für-Schritt)</li><li>• <b>Index</b> (Stichwortverzeichnis)</li></ul>
<b>Übungen</b>	Übungen zu den einzelnen Automatentypen und zu den JFLAP-Funktionen (mit Lösungen)
<b>JFLAP-Applet</b>	das eigentliche Programm JFLAP zum graphischen Konstruieren und Testen von Automaten
<b>Info</b>	(diese) Informationen für den Benutzer

**Einsteigern wird dringend empfohlen, zuerst die Help-Themen anzuschauen, bevor erste Schritte mit JFLAP unternommen werden!**

# JFLAP Study

- Study of JFLAP's effectiveness in learning
  - Runs 2005-2007
  - Pretest/Posttest
  - Interviews
- Supported by National Science Foundation, grant NSF DUE 0442513

# Twelve Participants

- Duke
- UNC-Chapel Hill
- Emory
- Winston-Salem State University
- United States Naval Academy
- Rensselaer Polytechnic Institute
- UC Davis
- Virginia State University
- Norfolk State University
- University of Houston
- Fayetteville State University
- University of Richmond

Looking for a few  
more for 2006-07

# Future Work

- JFLAP textbook (Linz and Rodger), out in 2007?
- JFLAP modifications