What Educational Portal of International Linear Algebra Society (ILAS) can do for teaching of LA?

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9:20 a.m. Friday January 7, 2011
Abstract

- ILAS have served its Education homepage for more than 10 years.

- We introduce 3rd edition of ILAS Education homepage as an educational portal for teaching of Linear algebra. We will show what are the new features of it, and discuss what this site can do for our teaching of LA.

- (Any comments will be respected, and will be considered in the revision process as soon as possible.)

http://www.ilasic.math.uregina.ca/iic/
and http://matrix.skku.ac.kr/ilas
Contents

1. Introduction of ILAS Educational portal
2. What is in there?
3. What are new features?
4. Conclusion + your comments
Services from 2007 to 2010
3rd Edition: ILAS Edu. homepage

http://matrix.skku.ac.kr/илас/index.htm

and

http://www.ilasic.math.uregina.ca/iic/

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3rd Edition: ILAS Edu. homepage

http://matrix.skku.ac.kr/ilas/index.htm

http://www.ilasic.math.uregina.ca/iic/

Connection of ILAS Committee

Some useful links for Educations

ILAS Educational Committee
- Steve Leon (Chair)
- Luz De Alba
- Guershon Harel
- David Lay
- Sang-Gue Lee

ILAS Executive Board
- President: Stephen Kirkland
- Vice President: Chi-Kwang Li
- Secretary/Treasurer: Leslie Hogben

Recent news

Recent news

[2010. 11. 01] Invitation for Nominations for the Householder Award XIV

The Alston S. Householder Award is given every three years for the best PhD dissertation in numerical linear algebra. It is presented at the triennial Householder Symposium on Numerical Linear Algebra, which will be held on June 12-17, 2011. We solicit nominations of dissertations by the candidate's PhD advisor. To be eligible, the dissertation must have been submitted between Jan 1, 2008 and Dec 31, 2010. The deadline for submission is Feb 1, 2011.

Details, including submission instructions and a list of prior winners, may be found at:
https://outreach.scidac.gov/HH11/index.html
3rd Edition: ILAS Edu. homepage

http://matrix.skku.ac.kr/ilos/index.htm
http://www.ilasic.math.uregina.ca/iic/

changing a language at this site to click this button.
Articles on Teaching of Linear Algebra


Some articles on teaching of Linear Algebra

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Major Search Publication Databases

- JSTOR: http://www.jstor.org/
- JOMA: http://mathdl.maa.org/mathDL/4/?pa=content&sa=viewDocument&nodeId=336
- MATHDL: http://mathdl.maa.org/
- MATHSCINET: http://www.ams.org/mathscinet/
- ICTCM: http://archives.mathuk.edu/ICTCM/

Linear Algebra Education Papers

- MathML and JAVA Implementation in Linear Algebra (2008)
- Teaching Linear Algebra at University (2003)
- How to Take Advantage of Technology in the Classroom and Avoid Its Pitfalls (1998)
- Pedagogy and Content Issues Sabgroup Report for the Park City Mathematics Institute Undergraduate Faculty Program (1998)
- Notes on a Lecture at Hale (1998)
- Resources for Teaching Linear Algebra (1997)
- Using MATLAB to Encourage Formation of Conjectures by Students (1994)
- The Linear Algebra Curriculum Study Group Recommendations for the First Course in Linear Algebra (1993)
- ILAS Education Committee Graduate Level Syllabi (1993)
Some Multimedia contents on teaching of Linear Algebra

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If you have recommended papers in this site, please inform to us by e-mail : seglee@skku.edu

A first course in Linear Algebra (Free Text Book)

This page contains more explanation about this project. The preface from Version 2.0 contains more specific details about how and why I wrote this book and is a good place to begin. The News section below lists some of the milestones in the development of the book, while greater detail can be found in the current Change Log, which is available off the Download page. The Download page also includes a link to two sample sections.

URL http://linear.ups.edu/about.html
Educational Tools

http://matrix.skku.ac.kr/ila/et/et.htm

More Educational tools

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That program is distributed by http://www.cs.wisc.edu/~ghost/gsvew/

If you have recommended papers in this site, please inform to us by e-mail : aglee@skku.edu

Random Problem Generator 1.5

Sang-gu Lee & Sungkyunkwan university Matrix Lab.
This is a self training system founded on the Internet environment. In this system, you can improve your mathematical knowledge about the linear algebra. It will make a problem set which was generated randomly and you can intensify your linear algebra skills by solving the problem set. If you passed elementary linear algebra classes, you can solve those problem-sets easily.

This system has been developed by the linear algebra team in Sungkyunkwan University. If you have any comments for this system, please contact us with your comments:
aglee@skku.edu

URL http://galias03.skku.ac.kr/rpg1.5/
Miscellaneous Resources

http://matrix.skku.ac.kr/илас/mr/mr.htm

Miscellaneous resources related to Educations

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If you have recommended papers in this site, please inform to us by e-mail : alee@skku.edu

Miscellaneous Resources:
- These materials are related with linear algebra educational activities.

AMS Committee on Education

The Committee on Education serves as the Society’s channel for communication and cooperation with other organizations on matters concerning education, provides a forum for the discussion of mathematics education issues, provides information and makes recommendations to the leadership and membership of the Society on education issues, and organizes elements of AMS meetings addressing mathematics education.

URL http://www.ams.org/ams/coe-home.html
ILAS Photos

http://matrix.skku.ac.kr/illas/ip/ip.htm

We have uploaded some ILAS photos

- This section is for ILAS community.
  If you have some good photo, please send to ucl@skku.edu or kwkim@skku.edu.
  It will be appeared in here and that will be a great contributions on the ILAS activities.
  Thank you in advance and we appreciate your concern.

- ILAS Conference Plans: http://www.illasc.math.uregina.ca/las/conferences/las.html
  1. Provo, Utah, USA, August 12-15, 1990 (ILAS Inaugural Meeting)
JMM 2010 photo in Linear Algebra Education session

Professor Carl C. Cowen at Joint Mathematics Meetings 2010
ILAS Photos


JMM 2010 photo in Linear Algebra Education session

Professor Jeff Stuart at Joint Mathematics Meetings 2010
Welcome to what we hope will be an active page devoted to discussions about teaching a second course in linear algebra and/or matrix theory. We hope that you will contribute your ideas and advice concerning any and all aspects of this important subject - texts, topics to include or exclude in such a course, project ideas, philosophical and pedagogical issues, needs of client disciplines, responses to other submissions, controversies... Please share your thoughts. This is an opportunity to help improve our image in the mathematics community by providing useful information to departments that need to teach a second course in linear algebra but which have no one on the faculty actively involved in the linear algebra community.

[For your suggestion, check here!]

There are several math education researchers who have done research explicitly related to improving the teaching of linear algebra and understanding how students learn it. Two of those, with links to their...
new 1. Evaluate \( \iiint f \, dv \), where \( f = z^2 \) on a cylinder \( x^2 + y^2 = 1 \), where bottom of the cylinder is \( z = 0 \) and whose top \( z = 1 \) is the part of the plane.

\[
x, y, z, \theta = \text{var}('x, y, z, \theta')
\]
\[
p1 = \text{implicit_plot3d}(z = \theta, (x, -2, 2), (y, -2, 2), mesh=True)
\]
\[
P2 = \text{implicit_plot3d}(x^2 + y^2 = 1, (x, \text{color='blue'}, mesh=\text{True})
\]
\[
P3 = \text{plot3d}(0, (x, -2, 2), (y, -2, 2), showp1 = \text{True}, \text{aspect_ratio}=1)
\]
Welcome to the KAIST Sage server.

This is the Sage notebook server at KAIST. Click here to log in to the "Groundhog Day" Sage server.
Click here to log in to the "Memorial Day" Sage server.

Read about the difference between the two servers.

There's a news page with information about downtime, upgrades, and so on. Put the RSS feed into your reader so you know why the server isn't working. :)

This server is maintained by Dan Drake. You can create an account on the Groundhog Day server by yourself, but if you'd like an account on the Memorial Day server (see the "about" page for the differences between those two servers), you'll need to email me: drdane@kaist.edu. You can also email me if there are any problems with the servers or have questions.

This server runs Ubuntu Linux, which I recommend. Try it today!

Random Link: Posts, Py
환영합니다!

Sage는 수학 소프트웨어 또는 접근입니다.

Sage 노트북

Sage 노트북을 설치하면 누구라도 서류 상호작용하는 언어를 만드는 소프트웨어를 만들 수 있고, 공동작업할 수 있으며 공개할 수 있습니다. 언어는 Sage, Python, Sage에 포함된 다양한 소프트웨어 코드를 사용할 수 있습니다.

복잡한 수학분야의 활용

Sage를 사용하여 기초적인 것에서부터 고급의 미적분학, 정수론, 암호론, 기하학, 군론, 그래프이론, 수치해석학, 선형대수학에 이르기까지 다양한 수학분야에 관련한 계 활용하실 수 있습니다.

오픈소스 지향의 소프트웨어

Sage를 이용하면 Magma, Maple, Mathematica, MATLAB에 대한 대안인 상호작용의 오픈소스 지향에 도움을 줄 수 있습니다. Sage는 오픈소스 수학 패키지의 수많은 오픈소스 소프트웨어로 사용 가능합니다.

Sage를 통한 심화된 수학研究成果의 활용

Sage는 대부분의 수학 소프트웨어들을 함께 사용하여 쉽게 만들 수 있습니다. Sage는 GAP, GPGPA, Magma, Singular 그리고 여러 다른 오픈소스들을 포함하고 있습니다.

주요 사용 언어

Sage는 최근 개발되는 소프트웨어를 사용한 Python을 이용하고 있습니다. 여러분의 수학 관련 코드를 사용해 작성할 수 있도록 하지 않고 있습니다.
### Sage Quick References for Linear Algebra and Calculus

#### Limits

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<tr>
<td>( \lim_{x \to a} f(x) = L )</td>
<td>( f(x) ) approaches ( L ) as ( x ) approaches ( a )</td>
</tr>
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#### Derivatives

<table>
<thead>
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<th>Description</th>
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<tr>
<td>( f'(x) ) or ( \frac{df}{dx} )</td>
<td>Derivative of ( f(x) ) with respect to ( x )</td>
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#### Vector Operations

<table>
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<th>Symbol</th>
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<td>( \mathbf{u} )</td>
<td>Vector</td>
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<tr>
<td>( \mathbf{v} )</td>
<td>Vector</td>
</tr>
<tr>
<td>( \mathbf{u} + \mathbf{v} )</td>
<td>Vector addition</td>
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<tr>
<td>( \mathbf{u} - \mathbf{v} )</td>
<td>Vector subtraction</td>
</tr>
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<td>( k \mathbf{u} )</td>
<td>Scalar multiplication</td>
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#### Matrix Operations

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<tr>
<td>( \mathbf{B} )</td>
<td>Matrix</td>
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<tr>
<td>( \mathbf{A} \cdot \mathbf{B} )</td>
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<td>Transpose of ( \mathbf{A} )</td>
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<td>Inverse of ( \mathbf{A} )</td>
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### Sage Quick Reference: Calculus

**Sage Version 6.4**

http://wiki.sagemath.org/quickref

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#### Simplifying and expanding

**Sage** is a computer algebra system that supports symbolic and numeric computation.

Sage allows you to define and manipulate symbolic expressions.

**Example:**

```python
sage: var('x y z')
sage: expr = x^2 + y^2 + z^2

Sage simplifies this expression:

```
x^2 + y^2 + z^2
```

#### Integrals

Sage supports symbolic and numeric integration.

**Example:**

```python
sage: var('x')
sage: integral(x^2, x, 0, 1)
sage: pi
```

Sage evaluates this integral:

```
\frac{1}{3} x^3 + C
```

#### Vector Operations

**Example:**

```python
def dot_product(u, v):
    return sum(x*y for x, y in zip(u, v))

v1 = [1, 2, 3]
v2 = [4, 5, 6]
dot_product(v1, v2)
```

Sage evaluates this dot product:

```
32
```

#### Matrix Operations

**Example:**

```python
A = matrix([[1, 2], [3, 4]])
B = matrix([[5, 6], [7, 8]])
C = A * B
```

Sage evaluates this matrix multiplication:

```
[19 22]
[49 58]
```

---

**Note:** Sage is a powerful open-source computer algebra system that can be used for both symbolic and numeric computations. It is particularly useful for solving problems in linear algebra and calculus.
Comment and discussion about Sage using Google Groups
This is the IMAGE – ILAS’ Bulletin
## ELECTRONIC Journal of LINEAR ALGEBRA

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Useful Links

ILAS | ICTCM | ACTM
Mathematicians who were born or died on 28th December

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<td>1935: Horsburgh</td>
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<td>1951: Mo Arthur</td>
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<td>1984: Edwin Wilson</td>
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Mathematically available (Click on a link below)

| Arthur Eddington | John von Neumann |

Theorem of the day from Robin Whitty

A quotation for today

Arthur Eddington (1882 - 1944)

Human life is proverbially uncertain; few things are more certain than the solvency of a life-insurance company.


Another quotation by one of today's mathematicians

We introduce the mathematicians born on this day
Conclusion (What can we do?)

We can

- Find some interesting papers related to linear algebra at this site.
- Find Educational tools for teaching of LA.
- Make connection to all useful sites for LA Educations.
- Read ILAS news through this portal.
- Catch up ILAS educational activities and others.

http://www.ilasic.math.uregina.ca/iic/
and http://matrix.skku.ac.kr/ilas
References

- http://ams.rice.edu/mathscinet/search.html
- http://galois09.skku.ac.kr/ila-s-old1/
- http://groups.google.com/group/skku-sage/browse_thread/thread/b9102cbac2355acc?hl=ko
- http://ictcm.pearsontc.net/
- http://matrix.skku.ac.kr/sage
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- http://sagenb.kaist.ac.kr/
- http://sagemath.org/
- http://scholar.google.com/
- http://www-groups.dcs.st-and.ac.uk/~history/Day_files/Now.html
- http://www.actm.net/
- http://www.elsevier.com/wps/find/homepage.cws_home
- http://www.ilasic.math.uregina.ca/iic/
- http://www.math.technion.ac.il/iic/IMAGE/
- http://www.sciencedirect.com/
Thank you!!