My 45+ Years at UW
Emeritus Lecture

June 2, 2017

Richard E. Ladner
University of Washington
Themes

• Before UW
• UW
• Beyond UW
Before UW
St. Mary’s College of California
1961-1965
Brother Alfred

- Founded Fibonacci Quarterly Journal
- Science building named after him
Fibonacci Numbers

\[ F_0 = 0, \quad F_1 = 1 \]
\[ F_n = F_{n-1} + F_{n-2} \]
Golden Ratio

\[ \frac{F_n}{F_{n-1}} \rightarrow \frac{1 + \sqrt{5}}{2} \approx 1.618 \]
Golden Ratio in Nature & Art
Fibonacci Identity

\[ F_n \times F_{n-1} = \sum_{i=0}^{n-1} F_i^2 \]
My First “Computer”

MonroeMatic Model 88N, 1950s
University of California, Berkeley
1965-1971

- Mathematical Logic
- Computability

Robert W. Robinson
Simon Fraser University
1970-1971

- Computability
- Completed Dissertation

Alistair Lachlan
Units

• Computer Science Group
  – 1967 - 1975

• Department of Computer Science
  – 1975 - 1989

• Department of Computer Science and Engineering
  – 1989 - 2017

• Paul G. Allen School of Computer Science and Engineering
  – 2017 - ??
1967 Founders

- John Cramer – Physics
- David Dekker – Math
- **Hellmut Golde – EE**
- Allen Goldstein – Math
- Alistair Holden – EE
- Edgar Horwood – Civil
- Earl Hunt – Psychology
- David Johnson - EE

- Ted Kehl – Physiology/Biophysics
- Laurel Lewis – EE
- Jerre Noe – CS
- Ron Pyke – Math
- R.W. Ritchie – Math
- Terry Rockafellar – Math
- Jonathan Stanfield – Library School
The Early Hires

- 1968
  - Jerre Noe
- 1969
  - Jean-Loup Baer
- 1970
  - Joe Traub
- 1971
  - Alan Shaw
  - Bob Herriot
  - Richard Ladner
- After 1971
  - ~120 hires and ~60 departures
Leaders

Noe

Golde

Notkin, Lazowska, Baer, Levy
Thanks to Jim Hook
My Offices

1971-1975

Roberts Hall, 1921

Sieg Hall, 1960

1975 - 2003
<table>
<thead>
<tr>
<th>UNIT WORKED</th>
<th>RATE</th>
<th>AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,00</td>
<td>M</td>
<td>1,167.00 M</td>
</tr>
</tbody>
</table>

**Address**: 

RICHARD E. LADNER  
WITHHOLDING TAX  
S.S.  
MEDICAL AID  
GROUP HEALTH

**Date of Payroll**:  
10 29 71

**University of Washington Employee's Earnings Statement**  
**Net Pay**: 911.51

**Non-Negotiable**

DETACH BEFORE DEPOSITING
Mementos from Roberts
SIGMA - 5
Memento from Sieg
Theory
Fibonacci Numbers

\[ F_0 = 0, \quad F_1 = 1 \]
\[ F_n = F_{n-1} + F_{n-2} \]
Parallel Prefix Computation

Compute in parallel

\[ x_1 \]
\[ x_1 x_2 \]
\[ x_1 x_2 x_3 \]
\[ \vdots \]
\[ x_1 x_2 x_3 \cdots x_{n-1} \]
\[ x_1 x_2 x_3 \cdots x_{n-1} x_n \]

Depth_0(n) = \log_2 n

Size_0(n) = 4n - F(5 + \log_2 n) + 1

Lesson about research

The impact of a research project is not necessarily related to how hard it was to accomplish.
Ladner’s Theorem

If $P \neq NP$ then not empty.

Migration of Early Theory Group

- Bob Ritchie → Industry
- Mike Fischer → Yale
- Larry Ruzzo → Computational Biology
- Martin Tompa → Computational Biology
- Richard Anderson → Developing World
- Richard Ladner → Accessibility
What is CS Theory

Double, double, toil and trouble.
Make this proof both long and subtle.
Throw in lemmas long and hairy
And an irrelevant corollary.
All my colleagues, I won't fear `em
Once I finally prove this theorem.

Rob Fowler, circa 1983
transmitted to me by Martin Tompa
Accessibility
Ephraim Glinert, 1985
Eve Riskin, 1990
Sheryl Burgstahler, 1992
Accessibility Students
Current Students
Undergraduate Research Students

• More than 100
• 23 were Mary Gates Research Scholars
• 3 Best Senior Thesis awards
• Non-UW
  – Stanford, Cal Tech, Olin, Brown, Harvey Mudd, U. of Puerto Rico, Norfolk State, Whitman
CRA Outstanding Undergraduate Researchers

Kevin Zatloukal, 2001

Kevin Dick, 2008
Lesson about students

• Initially, try to find a project to match a student’s interests and abilities.
• In the end, the student will find their own projects and succeed.
Accessibility Projects
DBNet

Anne Condon, Scott Rose, Dennis Gentry, Randy Day, Karin Meyer, Anne Dinning

CHI + GI 1987

Figure 1: The Hierarchy of the DBNet system with "news" expanded.
Tactile Graphics
Sangyun Hahn, Chandrika Jayant, Lauren Milne, Catie Baker, Ryan Drapeau, Josh Scotland, Dana Wen, Cian Malone, Satria Krisnandi, Matt Renzelmann
MobileASL

Jessica Tran, Charles Delahunt, Katie O’Leary, Jaehong Chon, Anna Cavender, Rahul Vanam, Neva Cherniavsky, Jessica DeWitt, Sam Whittle…
WebAnywhere

Jeff Bigham

Welcome to WebAnywhere

WebAnywhere has been initialized and is now ready to use. Press the "control + forward slash" key at any time to hear a list of available shortcut keys.

WebAnywhere is a non-visual interface to the web that requires no new software to be downloaded or installed. It works right in the browser, which means you can access it from any computer, even locked-down public computer terminals. WebAnywhere enables you to interact with the web in a similar way to how you may have used other screen readers before.

For quick access to WebAnywhere type wa.cs.washington.edu into your browser.

Select your preferred language in the selection box below. Switch between languages by pressing the Control key plus either the up or down arrow keys. When you have selected your language, press the Submit button.
Perkinput

Shiri Azenkot

iPhone VoiceOver Text Entry

Perkinput

Demo
ASL to English Dictionary
Danielle Bragg, Kyle Rector
Teaching
Graduate Teaching

• Automata and Formal Languages (8)
• Computability and Complexity* (6)
• Design and Analysis of Algorithms* (3)
• Computer Networks (3)
• Theory of Distributed Systems* (2)
• Logic in Computer Science* (1)
Professional Masters Teaching

- Applied Algorithms*
- Data Compression*
- Computability and Complexity
- Accessibility*
Undergraduate Teaching

- Data Structures*(12)
- Formal Models* (12)
- Theory of Computation* (4)
- Computer Networks (4)
- Data Compression* (3)
- Algorithms (3)
- Discrete Structures (3)
- Accessibility Capstone* (3)
Programming Languages

Fortran

PASCAL

C

PROGRAMMING
Lesson about Teaching

• Teach new courses now and then.
• No question by a student is stupid.
American Sign Language at UW
ASL at UW

• January 2005
  Sharon Hargus

• December 2006
  Ron Irving
Our ASL Faculty

Lance Forshay  
2007

Kristi Winter  
2010
Outreach at UW
Walker-Ames Lecturers

Harlan Lane 1993

Carol Padden 2006
Access Computing

Richard E. Ladner, PI
Sheryl Burgstahler, Co-PI and Director
Jacob O. Wobbrock, Co-PI
Andrew J. Ko, Co-PI

Founded 2006
Goal

Increase the participation and success of students with disabilities in computing fields.
AccessCSforAll Goal

Increase the participation and success of students with disabilities in K-12 Computer Science
Beyond UW
My Sign Language Teachers

Larry Petersen  Marilyn Smith  Theresa Smith
Shaka
More Dogs

Ginger

Abby

Lewis
Thanks to all who helped me on this journey