Moving the needle and growing women in computing in Latin America

Juliana Salles, PhD
Senior Research Program Manager

May, 24, 2012
Rane Johnson

- MSR/MRC initiatives in women in computing
  - projects that use technology to transform how we learn about history and how we eradicate human trafficking.
  - lead for growing, attracting and retaining women in STEM.
- She leads the worldwide efforts
  - Partners include NCWIT, CRA-W, AIB, ACM-W
Juliana Salles

- Microsoft Research Connections
  - Research projects in CS, bioenergy, climate change, biodiversity
- Software development @ Microsoft
- Since 2008, MSR is working with thought leaders in Latin America
  - Build awareness & drive change on the topic of women in technology
The status – some US statistics

- 58% of all professional occupations in the 2009 U.S. workforce are held by women
- 25% of professional computing occupations in the 2009 workforce are held by women
- 11% of corporate officer positions at Fortune 500 technology companies are held by women
Why is gender diversity in computing important?

- Gender balanced teams are more experimental and efficient
  - A study on U.S. technology patenting reveals that *patents created by mixed-gender teams are the most highly cited*
- Technology permeates all areas of knowledge
- By 2018, there will be nearly 1.4 million job openings in IT in the US
What is going on in Latin America?

- LATAM Summit WS and data gathering since 2008
  - Challenging process, but we’ve observed the same trends
- Collaboration with leading organizations
  - Discussing best practices and programs successful in other geographies
- Call to action
  - Pilot projects in Mexico, Colombia and Brazil
Lorena Gomez, ITESM, Mexico
Attract and Keep students in Information Technology: Making IT fun

Eduardo Freire Nakamura, UFAM, Brazil
Women in Computing - Towards Gender Balance in the North Region of Brazil

Jose Tiberio Hernandez, University of Los Andes, Colombia
Women in Computing in Colombia
The UniAndes project
Women in Computing - Towards Gender Balance in the North Region of Brazil

Eduardo Freire Nakamura
Research and Technological Innovation Center (FUCAPI)
Federal University of Amazonas (UFAM)
Overall Numbers

Computer Engineering (since 2004)
- Entrance: 12% (58/465)
- Dropouts: 14% (24/177)

Computer Science (since 1999)
- Entrance: 16% (123/768)
- Dropouts: 16% (40/251)

Information Systems (since 2010)
- Entrance: 20% (38/187)
- Dropouts: 36% (4/11)
Why Growing Women in Computing?

Official Census (North Region)
51% of local population is female
Our numbers are very modest (12~20%)

Local Job Opportunities
Industrial Park with 600 enterprises (electronics, computing, motorcycles)
Half a million jobs
Three business incubators

Job Distribution
High profile: Male, locals and from other regions
Low profile: Female, locals
What Strategy?

We need a better understanding
Historical, cultural and economical aspects are important

Possibilities
Workshops, speaker series, mentoring, networking
Students have expressed their wish to meet successful professionals that have reached a balance in their professional, social, and personal life

First Step: Awareness
Objectives

Assess and tackle the gender issue in Computing
The whole pipeline is important: prospective students, undergraduate/graduate programs, professional careers

Landscape of the gender diversity
Provide a clear landscape of the gender diversity in Computing for Brazilian North Region
Understand the social, economic and cultural differences compared to the other Brazilian regions, Latin America, North America, and Europe

Changing the landscape
Defining small actions for the daily cultural change and congregating other colleagues
Assessing strategies for improving gender diversity in the Brazilian North Region
Our Strategy

Group meetings (bimonthly)
Meetings to assess the project status, define next steps

Speaker Series (quarterly)
Leading researchers and practitioners engaged in the gender issue to share their experience
Initial targets: students, professors and the working group

Workshop
Local open event for the local community (academia and industry) for a broad discussion

Attend Specialized Forums
Expected Deliverables

Comprehensive Report
Current landscape of the gender issue in the Brazilian North Region (including social, cultural, economic aspects)

Work plan
A detailed work plan and public information to improve the gender diversity awareness
Identifying Brazilian, Latin America and worldwide partners to share experiences and align efforts

Financial Strategy
A coherent and realistic strategy to raise additional resources (human and financial) for future steps
Attract and Keep students in Information Technology: Making IT fun

Lorena Gómez
Computer Science Department
Tecnológico de Monterrey
May 2012
Lorena Gómez

Bio

Director of Master’s Program in Software Engineering and Information Technology at ITESM Monterrey Campus.
Teaches graduate and undergraduate courses in Databases and Software Engineering.
Collaborating with the University of West Indies on the development of an application framework for mobile payments in support of micro-economies in Latin America and the Caribbean, sponsored by LACCIR
Microsoft Enterprise Consortium and Microsoft Dynamics Academic Alliance Board of directors member.
Lorena received a B.S in Computer Science, a M.S. in Computer Science from Tecnológico de Monterrey and a Ph.D. in Computer Science from Arizona State University.
Women in IT @ Tec de Monterrey

Some Data
10-15% Female Students
Dropout in girls is not common at ITESM, MTY
Female students are in the top 10% best students

Industry Needs IT Professionals
Companies need more IT Professionals: Male and Female
Students get 2 or 3 job offers before graduation

Conclusion
Attract and Keep students in Information Technology (both genders)
Project Description

Workshops
Mini Robotics for Kids
Create your own Video Game
(Kinect/windows phone)
Magic behind the screen (Multitouch)
Playing with Data

Web Site/Social Site
A day in the life of a
(Software Engineer, IT Consultant, students)
Interviews with successful people (Women)
News/Statistics/List of best Jobs
Webinars from successful IT People (Specially Women)
Success Story

MiniRobotics for Kids

- 10-14 year old
- 12 four-hour sessions
- Design, Assembly, Code, Test → ZumoBot Competition
- Instructors are students majoring in CSE / Robotics/ EE doing Social Service
- Final Project: ZumoBot Competition
Classroom competition

Build

Code Review and Test

Name your Robot

Wallie
ScrewDriver
Terminator

Fight
All family members participate
Final Round: Robotics 1
End of Workshop Survey

Distribution

Will you pursue a career in IT?

- Boys: 80% Yes, 20% Girls
- Yes: 100%, Not Sure: 20%, No: 0%
MiniRobotics Workshops 2007-2011

<table>
<thead>
<tr>
<th>Period</th>
<th>Alumnos</th>
<th>Instructores</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ago-Dic 07</td>
<td>12</td>
<td>3</td>
</tr>
<tr>
<td>Ene-May 08</td>
<td>30</td>
<td>10</td>
</tr>
<tr>
<td>Ago-Dic 08</td>
<td>75</td>
<td>25</td>
</tr>
<tr>
<td>Ene-May 09</td>
<td>110</td>
<td>40</td>
</tr>
<tr>
<td>Ago-Dic 09</td>
<td>150</td>
<td>55</td>
</tr>
<tr>
<td>Ene-May 10</td>
<td>187</td>
<td>89</td>
</tr>
<tr>
<td>Ago-Dic 10</td>
<td>320</td>
<td>103</td>
</tr>
<tr>
<td>Ene-May 11</td>
<td>315</td>
<td>112</td>
</tr>
<tr>
<td>Ago-Dic 11</td>
<td>380</td>
<td>120</td>
</tr>
</tbody>
</table>

![Graph showing growth in MiniRobotics workshops 2007-2011]
Workshops in Computing for kids

Kinect
Windows Phone / Touch screen monitors
Others...

Social Networks/ Site

Hope to get some videos from role models (specially Women)

Ideas/Experiences/Comments from Audience

We would like to hear from you! Lgomez@itesm.mx
Women in Computing in Colombia
The UniAndes project

José Tiberio HERNANDEZ
Rubby CASALLAS

Associate professors
University of los Andes – Bogotá - Colombia

May 23 – 25  2012
Women in Computing in Colombia
The UniAndes project

- Generalities
- Colombian situation
- UniAndes survey
- The Contest
What is Women in Computing?

Women in Computing (WIC) is a project of the Department of Systems & Computing Engineering in University of los Andes Colombia, it is partially funded by Microsoft Research.

The main **objective** of WIC is to discover and understand the reasons why the participation of women in the fields of computing has been declining and is so low, and proposing actions to change this trend.
Women in Computing

Why?

The lack of participation by women leads to a reduced view of the needs of society, so the proposed solutions are insufficient. If women had a greater participation in working groups, organizations would have more varied and dynamic groups that produce more adequate solutions.

The role of women is very important in the computing area because of reasons of diversity and competitiveness.
What do we do?

We analyze quantitative and qualitative information that allows us to understand the phenomenon.

We create mechanisms for participation and inclusion of women in our program in Systems & Computing Engineering.

We establish inter-institutional links that allow us to accomplish these actions.
Colombia

Population: 46 million

Bogotá

Population: 6.8 million
Educational, administrative, financial and political center of Colombia
University of Los Andes

Enrollment 2011:

12,502 undergraduate
2,179 MSc
274 PhD
La gráfica se puede apreciar la participación (no normalizada) por género de las Universidades de Colombia. Se puede apreciar que la cantidad de estudiantes Hombres matriculados se incrementa año a año, mientras que la cantidad de estudiantes Mujeres matriculadas se decrementa año a año.
Participation by gender in UniAndes in Computing (absolute numbers)

En la gráfica se puede apreciar la participación (no normalizada) por género de la Universidad de los Andes. Se puede apreciar que la cantidad de estudiantes tanto hombres como mujeres matriculados se decrementa año a año, pero el decremento por parte de las mujeres es mayor, si comparamos el año 2000 y el año 2011 es del 64.28%, mientras que el decremento de los hombres es solo del 26.08%.
SURVEYS
What are the perceptions of high school students regarding Systems & Computing Engineering?

To answer this question we have made 92 surveys to students from different high-schools, 61 of these surveys were answered by women and the remaining 31 were answered by men

*(High school students in an OpenDay at the Engineering School)*
La primera pregunta realizada fue, cuál es la carrera que desea estudiar?

En la gráfica se puede observar las preferencias de los hombres, donde se puede observar claramente que la mayoría de los encuestados desean estudiar una Ingeniería. Estando en primer lugar Ingeniería de Sistemas, en un muy cercano segundo lugar Ingeniería Electrónica y en tercer lugar Ingeniería Civil.

(High school students in a OpenDay in the engineering School)
(High school students in a OpenDay in the engineering School)
I think that studying Systems and Computing Engineering... (Men)

- It is difficult and very technical: 3 (It is true) 17 (Not Always) 5 (It is not true)
- I need to know a lot of math, and I like that: 10 (It is true) 11 (Not Always) 1 (It is not true)
- I need to know a lot of math, and I do not like that: 6 (It is true) 6 (Not Always) 6 (It is not true)
- It makes it difficult to make friends because it doesn’t allow to make a lot of social interaction and leads to isolation: 2 (It is true) 7 (Not Always) 0 (It is not true)
- It is a career for men: 25 (It is true) 15 (Not Always) 6 (It is not true)
- It is a very interesting challenge that opens many doors: 29 (It is true) 0 (Not Always) 2 (It is not true)
- It provides opportunities to be near to the technological changes (phones, video games, television, quality of life, etc.): 2 (It is true) 0 (Not Always) 3 (It is not true)

(High school students in a OpenDay in the engineering School)
I think that studying Systems and Computing Engineering... (Women)

- It is difficult and very technical: 20 It is true, 13 Not Always, 0 It is not true
- I Need to know a lot of math, and I like that: 6 It is true, 10 Not Always, 1 It is not true
- I Need to know a lot of math, and I do not like that: 3 It is true, 6 Not Always, 0 It is not true
- It makes it difficult to make friends because it doesn’t allow to make a lot of social interaction and leads to isolation: 2 It is true, 2 Not Always, 0 It is not true
- It is a career for men: 51 It is true, 1 Not Always, 1 It is not true
- It is a very interesting challenge that opens many doors: 50 It is true, 1 Not Always, 0 It is not true
- It provides opportunities to be near to the technological changes (phones, video games, television, quality of life, etc.): 3 It is true, 1 Not Always, 0 It is not true
- It is not fashionable or there are more interesting career: 8 It is true, 9 Not Always, 1 It is not true

(High school students in an Open Day in the engineering School)
The fourth question should be selected for the sentence (many respondents did not select the options).

"Razones para NO estudiar Ingeniería de Sistemas y Computación".

The results shown are for the men, and it can be seen that the majority of the respondents think they do not have knowledge of the program action fields and the investment total for the career is very high.

(High school students in an OpenDay in the engineering School)
Los resultados mostrados son de las mujeres, y se aprecia que la mayoría de las encuestadas que respondieron, piensan no tienen conocimiento de los campos de acción del programa y que no tienen las habilidades que se exigen en el programa.
Actions to advance

How & What to communicate to young students? (9th to 11th degree)

- MSR/UniAndes project
  - A website focused on WIC
    - http://sistemas.uniandes.edu.co/mujeresencomputacion/
  - A set of local & permanent surveys (from 9th to 12th)
  - A contest to seek new ways to communicate
Best Proposal Contest 2012

This competition aims to encourage the creation of proposals to high school students between 9° and 11°, and to motivate the participation of women in computing, in particular, the program of Systems and Computing Engineering, of University of los Andes.

Change the preconception related to the Systems and Computing Engineering career.

To publicize the application fields and professional profiles of the career.
Best Proposal Contest 2012

Dates:
Deadline for proposals: September 4, 2012
Publication of pre-selected proposals: September 14, 2012

Selection of winners: September 21, 2012

Prizes:
First place: COP$3'000.000
Second place: COP$2'000.000
Third place: COP$1'000.000
Women in Computing in Colombia
The UniAndes project

- A big challenge
- Become an institutional concern
- Suggestions?
Some stats in Brazil

- 42% of all professional occupations in Brazil workforce are held by women.
- 54.6% of bachelor degree recipients in Brazil are women.
- 19% of bachelor degree recipients in IT are women.