

Luz Rello

By Marta Lobo de Pablos

When I first thought about this assignment, I knew for sure I would be writing about a female Software Engineer. Not only because I think women are underrepresented in this field and there should be more of us in the front row; but also, because sometimes, when technology is seen as too cold or insensitive, it is because of false prejudice and the concept of it being a man's world. That is why, after attending a conference where Luz was keynote speaker, I learnt about how human Computer Engineering is, and why I love it: because it can really change the world and help people in a way what was not feasible before.



Photography by Julio Gonzalo

Luz Rello Sánchez is an Spanish PHD in Information and Communication Technologies. She was born in Madrid in 1984, and graduated with honours in Linguistics, by the Universidad Complutense de Madrid. Her background had nothing to do with Computer Science until she did a Master's degree in Natural Language Processing and Human Language Technologies, by the Universidad Autonoma de Barcelona, in a joint program with the University of Wolverhampton, in England. Her PHD research took place in the Universitat Pompeu Fabra in Barcelona, and in 2014 she started her post-doctorate research in the University Carnegie Mellow, in Pittsburgh (USA).

She has been awarded in several occasions, thanks to her excellence in her studies. Among all these honors, the most noticeables are the *European Young Researchers' Award (EYRA)* by the Euroscience organization in 2013, the MIT Technology Review's *Social Innovator* award, in 2014; and the *Princess of Girona* Award, that honors her social awareness, in 2016. In 2017 she was included in the Forbes list of 30 Under 30.

She is Founder and CEO of *Change Dyslexia*, a social enterprise that wants to help minimize the negative impact of dyslexia worldwide, by providing a free detection test and a reinforcement treatment for affected kids.

Academic Background

Luz's academic and professional excellence is very impressive, but even more when knowing what she is dealing with every day: dyslexia. Luz is dyslexic, and during her school years she had a tough time trying to learn and study the same way her classmates did. She was diagnosed when she was 10 years old, and before that, she *hid* her problem by memorizing her books to then pretend to be reading.

Due to this, she had a hard time in school: it was harder to make friends when thinking about being more stupid than everyone else, failing every time and having a lot of misspelling mistakes. Once she was diagnosed and started with reinforcement classes she began passing her classes and was able to finish obligatory education.

Having to struggle with reading and writing, she developed a strong visual memory and, as she says about all the people with dyslexia, a great ability of hard-work and effort: "An ability that dyslexia gives you is that, as you are used to put a lot of effort in everything, you develop a work habit and a culture of effort that are part of you, and in the end they are a gift for your life, not a sacrifice but an advantage."

Luz managed to go to university, and chose to study Linguistics because, since she was little, she wanted to understand and *master* her language. She started by making word lists and trying to find an order and an explanation to how the language was built; and she found it when, at the age of eleven, she read and did an extensive summary of the book *Orthography*, by the Royal Academy of the Spanish Language.

Getting to know that every language can be modelled, and has *mathematical order* somehow, fascinated her. During her degree she found out about Natural Language Processing, an Artificial Intelligence Branch that does exactly that, and when she graduated in 2008 (First Class Honors), she pursued the first master's degree in this discipline that existed in England (as there were none in Spain back then), thanks to a grant from Fundació La Caixa.

Luz taught herself to code and worked very hard to overcome all the difficulties related to the language, being abroad and studying something completely new to her. Once she finished her master's, she did an internship in a company in Madrid and had to read the whole Spanish dictionary to develop an ontology.

When the time to make a career choice came in 2010, she considered to pursue a PHD as she thought she could achieve a lot more, so she went to the Universitat Pompeu Fabra in Barcelona and began a research in Language Modelling. She kept struggling with her dyslexia when writing papers and reports, so when her Thesis Director, Ricardo Baeza-Yates, asked her about her difficulties, she had to confess. Then, he suggested her to study more about her disorder, since she knew better than anyone how to overcome it and would be able to help more people like her. She finished in 2014 with a thesis about an Internet text reader tool called *DysWebxia. A Text Accessibility Model for People with Dyslexia*.

Post doctorate: Carnegie Mellow

Luz's won several prizes and published many papers with her PHD research – despite the difficulties, as it involved both Linguistics and Computer Science, two completely separated disciplines. Soon before being done, she met Jeff Bigham, an important researcher in Human-Computer Interaction from Carnegie Mellow University, in Pittsburg (USA). He was amazed by her work and offered her to continue investigating in their laboratory, the most important in the United States along with the MIT.

Luz's decision was tough, but instead of joining the CS industry she chose to keep working for helping people with dyslexia. She felt very committed to the cause and, by the example of her mother, who is a social worker, she was encouraged to fight again the social injustice of dyslexia people being kicked out of the system.

The resources available in Carnegie Mellow allowed her to amplify her research and start running mayor experiments with multiple families. She encountered some bureaucratic difficulties, such as having to meet the families on the weekends and having them cross several security controls, but that did not stop her and her team.

After some negative results and unsuccessful approaches that did not put her off, Luz and her team began getting positive results with DyetectiveU, a method to improve writing and reading skills for kids with dyslexia. The first longitudinal evaluation took place in Barcelona, in the L'Estonnac School, and proved that their own method was effective. The other successful tool they developed was a detection test, using Automatic Learning, which after several communication campaigns asking for people's collaboration, reached an 80% of effectiveness.

Change Dyslexia

In 2015 Luz Rello founded Change Dyslexia, a social enterprise that allows to put her broad research in practice. Its main goal is to reduce the school dropout numbers in kids with dyslexia worldwide. Between 7% and 10% of the population is dyslexic; however, this is a hidden disorder inappropriately treated in most of the cases.

The research results are integrated in Dyetective: a social and scientific tool to detect and treat dyslexia in children from 7 years old. It is divided in Dyetective test, a free screening test to detect dyslexia in Spanish-speaking kids; and DyetectiveU, a personalized game-based treatment for tablets, radically cheaper than all the current alternatives.

Change Dyslexia, as a social enterprise, is compromised to change the status quo globally. The detection test has been already used in fifty-seven countries by more than 130.000 children. They have developed a *dyslexia map* of Spain and are planning on doing the first Dyslexia World Map, helped by Eduardo Graells and Ricardo Baeza-Yates.

The success of this tool is that it addresses all three barriers of dyslexia. Firstly, its lack of visibility. Most of the people that suffered it don't even know, as they have learnt to hide it and deny it. The test is completely free, so everyone can take it and this barrier can be overcome.

The second barrier is the school dropout, due to reading and writing difficulties that dyslexic people have. DytectiveU helps every kid by adjusting the exercises according to the flaws and strengths of each person. This treatment improves a lot with professional help, so schools and therapists can also use it to monitor their pupil's progress.

The last barrier is the socioeconomic one. The application is very cheap compared to the current alternative; however, Change Dyslexia, by partnering with other businesses through their CSR policies, offers scholarships to those families who cannot afford the fee. Their mission is not to profit, but to solve a real issue and reach every single kid with dyslexia worldwide. They are trying to be sustainable and continue their work by exporting their model to any language – creating a unified system based on visual and auditory symbols - and maintaining their apps for IOS and Android.

To prove the effectiveness of their method, Luz and her team have recently concluded a successful longitudinal study in four schools in Madrid. After following 112 children for six months, they have found that those who played with the app for 8 weeks, in four sessions of 15 minutes, have improved significantly in several competences, becoming *less dyslexic*.

Superar la dislexia – Overcoming dyslexia

While Change Dyslexia continues growing and reaching more and more kids, Luz has recently released a book, *Superar la dislexia (Overcoming dyslexia)* to provide tools and support for parents and families of kids with dyslexia. To help this disorder to *come to light*, she has interviewed 15 important personalities with dyslexia. Furthermore, she provides with tools and resources for an appropriate support to help overcome dyslexia. The book is currently sold-out and the second edition is pending. All benefits will be destined to create more scholarships for DytectiveU.

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