

Francisco Costela, PhD

Harvard Medical School, Boston, MA
✉ francisco.costela@gmail.com ☎ +1 602 748 9461

Data Scientist

🐙 [fcostela](#) [in francisco-costela](#)

Professional summary

Extensive experience on data science, machine learning, computer vision, visual psychophysics, and eye tracking while working in vision science for 10+ years. I have developed a strong passion to work with big datasets, build predictive models, find trends, and produce stunning reports. I want to keep applying my knowledge within technologies involving machine learning and computer vision. 4+ years professional programming. Technical literacy and project management. Open to relocate.

Relevant skills

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|---------------|---|
| AI/ML | Python/TensorFlow, Keras, Scikit-learn, Numpy, Pandas, NLP |
| Coding | Adept at Python and Matlab. Knowledge of C/C++, Java, Stata |
| Databases | SQL, Excel - Web development MySQL, HTML, CSS, PHP |
| Visualization | OpenCV, Plotly, Seaborn, Illustrator, Powerpoint, Psychtoolbox, Tableau |
| Research | 20 peer reviewed articles 🎓 Google Scholar- 27 verified reviews ✍️ Publons link |
| Communication | 21 contributions to international meetings, including ICMLT, ARVO, SFN, VSS |

Employment

- 2019-present **ML innovator**, as *Research Programmer at Harvard Medical School*, Boston, MA.
- Implemented feed-forward neural networks to predict hazard detection in driving videos using features from eye tracking data
 - Conducted NLP analyses to evaluate cognitive and visual function. Gathered crowd-sourcing responses from auditory descriptions using Amazon Mechanical Turk
 - Developed recurrent neural (LSTM) networks and Taylor series methods to boost prediction of gaze landing on gaze-contingent paradigms
 - Created a new Quality of Life instrument to evaluate functional vision from a population of 500 patients with retinitis pigmentosa (RP) using Rasch analysis
- 2015-present **Data scientist**, as *Sr Fellow at Schepens Eye Research Institute*, Boston, MA.
- Built a freely open-access eye-movement database watching movies. 🔗 [Link](#)
 - Created clusters and archetypes (unsupervised learning) to classify visual functional fields and correlate with hereditary patterns in a population with RP
 - Applied gaze tracking and video processing to identify the preferred retinal locus used by people with low vision while watching video
 - Developed visual rehabilitation techniques based on zoom/bubble magnification and dynamic content guide for people with macular degeneration and hemianopia
- 2011-2014 **Computer vision**, as *Researcher at Barrow Neurological Institute*, Phoenix, AZ.
- Applied electrophysiology with macaques to map eye movements in the visual cortex
 - Developed software and interface to import, process, and plot eye tracking data
 - Wrote a thesis on the roles of fixational eye movements in perception, cognition, and oculomotor control developing psychophysics experiments

- 2009-2010 **Medical imaging**, as *Researcher at Pablo de Olavide University*, Seville, Spain.
 - Analysed fiber tract and DTI (Diffusion tensor imaging) from patients with dementia
 - Processed magnetic resonance image data using Freesurfer pipelines and FSL segmentation tools
- 2009 **Medical imaging**, as *Trainee at FMRI Oxford University*, Oxford, UK.
 - Detected the stria of Gennari (area in the visual cortex) in brain MRI scans
- 2007-2008 **Senior Programmer**, *Ebrisa*, Chicago, USA, MyEclipse, J2EE, Struts, Hibernate, MySQL, Css, Taglibs, XML.
- 2006-2007 **Junior Programmer**, *Telefonica I+D*, Madrid, Spain, JAVA Technology, J2EE, JABX, SOAP, XML, Javascript, Beanshells, PJTools, Oracle Database.
- 2005-2006 **Junior Programmer**, *Ocean Lab*, Edinburgh, UK, Design of an autonomous underwater vehicle. Sonar management, C++, OpenCV  [Link](#).
- 2005 **Trainee**, *MADOC*, Granada, Spain, Maintenance and development of applications involving database access to Oracle and Access from Delphi and Jbuilder.

Education

- 2011-2014 **PhD in Neuroscience**, *Arizona State university*, Tempe, AZ, USA.
- 2019-2010 **MSc in Neuroscience**, *Pablo de Olavide University*, Seville, Spain.
- 2008-2009 **MSc in Biomedical Engineering**, *Oxford University*, Oxford, UK.
- 2005-2006 **BSc Computer Engineering - thesis**, *Heriot-Watt University*, Edinburgh, UK.
- 2000-2005 **BSc Computer Engineering**, *University of Granada*, Granada, Spain.

Other work experience

- 2017-present **"Vision: A System and its Assessment - Eye Movements"**, *Lecturer*, Harvard University/Schepens Eye Research Institute, 2 semesters.
- 2016-present **"IMFAHE Fellowship"**, *Advisor*, Spain-USA, 10 grad students.
- 2015-present **"International Mentor Program"**, *Mentor*, Spain-USA, 4 grad students.
- 2013-2014 **"BIO 201 Anatomy and Physiology"**, *Graduate Teaching Associate*, School of Life Sciences, Arizona State University, 3 semesters.
- 2011-2012 **"Ask a biologist"**, *GPSA Volunteer*, Arizona State University.
- 2009-2010 **"Spanish"**, *Spanish Official Helper*, Oxford Language Centre.

Courses

- 2018 **Successful grant writing**, *Harvard Catalyst*.
- 2017 **Effectively communicating research**, *Harvard Catalyst*.
- 2015-2016 **Certificate in Applied Biostatistics**, *Harvard Catalyst*.
- 2015 **Fundamentals of Clinical and Translational Research**, *Harvard Catalyst*.
- 2013 **Machine Learning**, *Coursera Stanford University*.
- 2009 **MRI Physics course**, *FMRIB Oxford*.