

BIOGRAPHY

Albert Guillén i Fàbregas was born in Barcelona, Catalunya, Spain, in 1974. He received the Telecommunication Engineering Degree and the Electronics Engineering Degree from [Universitat Politècnica de Catalunya](#), Barcelona, Catalunya, Spain, and the [Politecnico di Torino](#), Torino, Italy, respectively, both in 1999, under the Double Degree Socrates-Erasmus Scholarship Program of the European Community, and the Ph.D. in Communication Systems from [Ecole Polytechnique Fédérale de Lausanne](#) (EPFL), Lausanne, Switzerland, in 2004.

He is a Research Professor of the Institució Catalana de Recerca i Estudis Avançats (ICREA) hosted at the [Department of Information and Communication Technologies, Universitat Pompeu Fabra](#), Barcelona, Spain, and a Reader (on leave) at the [Department of Engineering, University of Cambridge](#), United Kingdom, where he is also a Fellow of [Trinity Hall](#). He is also a regular visitor at the [Centre de Recerca Matemàtica](#).

From August 1998 to March 1999, he conducted his Final Research Project at the [Center for Wireless Communications and Signal Processing Research](#), at the [New Jersey Institute of Technology](#), Newark, NJ. He was with Telecom Italia Labs, Torino, Italy, from November 1999 to June 2000. From September 2000 to May 2001, he was with the [European Space Agency](#) (ESA), Noordwijk, The Netherlands. During his doctoral studies, from 2001 to 2004, he was a Research and Teaching assistant at the Mobile Communications Department, [Institut Eurécom](#), Sophia-Antipolis, France. From June 2003 to July 2004 he was a visiting scholar at the [Communications Theory Lab](#) at EPFL. Since September 2004 until December 2006 he was a Research Fellow at the [Institute for Telecommunications Research, University of South Australia](#), Mawson Lakes, Australia. From January 2007 until September 2011 he has been a Lecturer at the [Signal Processing and Communications Laboratory, Department of Engineering, University of Cambridge](#), Cambridge, United Kingdom. He held visiting appointments at [Ecole Nationale Supérieure des Télécommunications](#), Paris, France (June-July 2005 and June 2006), [Universitat Pompeu Fabra](#), Barcelona, Spain (September 2008), at the [Institute for Telecommunications Research, University of South Australia](#), Mawson Lakes, Australia (December 2008, June-July 2010) and [Texas A&M University at Qatar](#) (May 2010). His specific research interests are in the area of communication theory, information theory, coding theory, digital modulation and signal processing techniques, particularly with wireless terrestrial and satellite applications.

Dr. Guillén i Fàbregas received the Starting Grant from the [European Research Council](#), the Young Authors Award of the 2004 European Signal Processing Conference EUSIPCO 2004, Vienna, Austria, the 2004 Nokia Best Doctoral Thesis Award in Mobile Internet and 3rd Generation Mobile Solutions from the [Spanish Institution of Telecommunications Engineers](#), and a pre-doctoral Research Fellowship of the Spanish Ministry of Education to join ESA. He is an Editor of the [Foundations and Trends in Communications and Information Theory](#), Now Publishers. He is also a Senior Member of [IEEE](#) ([Information Theory](#) and [Communications](#)

[Societies](#)), of the [ARC Communications Research Network](#) (ACoRN), and a Junior member of the [Isaac Newton Institute for Mathematical Sciences](#). He has been an Editor of the [IEEE Transactions on Wireless Communications](#) (2007-2011).

PROJECT

European Research Council Starting Grant

Project acronym: **FLINT**

Project full title: **Finite-Length Information Theory**

Overview

Shannon's Information Theory establishes the fundamental limits of information processing systems. A concept that is hidden in the mathematical proofs most of the Information Theory literature, is that in order to achieve the fundamental limits we need sequences of infinite duration. Practical information processing systems have strict limitations in terms of length, induced by system constraints on delay and complexity. The vast majority of the Information Theory literature ignores these constraints and theoretical studies that provide a finite-length treatment of information processing are hence urgently needed. When finite-lengths are employed, asymptotic techniques (laws of large numbers, large deviations) cannot be invoked and new techniques must be sought. A fundamental understanding of the impact of finite-lengths is crucial to harvesting the potential gains in practice. This project is aimed at contributing towards the goal of providing a unified framework for the study of finite-length Information Theory. The approach in this project will be based on information-spectrum combined with tight bounding techniques. The results of this project will be of benefit to areas such as communication theory, probability theory, statistics, physics, computer science, mathematics, economics, bioinformatics and computational neuroscience.