Proposal for ITW 2016
Cambridge, 12-14 September 2016

Presented by Miguel Rodrigues & Jossy Sayir

Information Theory in the U.K.

- "London" Symposia on Information Theory (1950, 1952, 1955, 1960, the original ISITs!!)
- Birthplace of the Binary Erasure Channel (introduced by Peter Elias at the 3rd London Symposium)
- ISIT 1985 in Brighton
- Re-discovery of Gallager's LDPC codes by David MacKay and Radford Neal in 1997
- International Symposia on Coding and Communications (Ambleside biennials, 1991 - 2009)

Information Theory in the U.K.

Information theory is deeply ingrained in national symbolism. . .

Information Theory in the U.K.

- ▶ The past 2 decades have seen a period of decline for British information theory
- ▶ Number of participants from the U.K. at ISIT dropped to near zero
- ▶ A number of universities in the U.K. have recently hired young information theorists (Cambridge, Bristol, Imperial, UCL, Sheffield, Lancaster, and others)
- ▶ It's time for information theory to return to the U.K.!

ITW 2016: the committees

- General co-chairs: Deniz Gündüz, David MacKay, Jossy Sayir
- TPC chairs: Helmut Bölcskei, Rob Calderbank, Miguel Rodrigues
- Publications Chair: Iñaki Esnaola
- Financial Chair: Ramji Venkataramanan
- Publicity Chair: Michèle Wigger

Technical Program: Ethos

- The UK traditionally emphasizes engineering practice over theory. But there is now an opportunity to show to the UK engineering community how information theory plays a role in guiding practical system design
- With the view to draw young researchers into the field, we propose to lay out a technical program that emphasizes emergent themes within the general area of information theory that are also well represented within the UK:
  - The technical program will consist of 3 main themes aligned with each day of the workshop;
  - The themes will address both fundamental questions as well as practical ramifications;
  - The themes will encompass both plenary talks, special sessions and regular contributions.
- In addition to the special themes, we also intend to accept regular contributions in the areas of:
  - Source and channel coding; joint source channel coding; Shannon theory; network information theory; wireless and optical communications systems and networks.

Technical Program: Themes (i)

- **Theme 1: Information Theory, Statistics and Machine Learning:**
    - The UK exhibits strong groups in the general fields of computational statistics and machine learning, e.g. in Cambridge U., U. Edinburgh, Imperial College, Oxford U., UCL, Microsoft Research Cambridge, to name a few.
    - Intersections between Information Theory and Statistics
    - Intersections between Information Theory and Machine Learning
    - Fundamental limits in sensing and analysis of high-dimensional data from low-dimensional features:
        - Tradeoffs between data volume, performance and complexity
        - Algebraic data representations and associated performance

Technical Program: Themes (ii)

- **Theme 2: Information Theory and Compressive Sensing**
- The UK also exhibits strong groups in the general fields of compressive sensing. The University of Cambridge currently boasts several groups working not only in the theory of compressive sensing but also in applications of compressive sensing in medical imaging (MRI) and other imaging modalities.
- Fundamental limits in compressive sensing in the real world (under physical constraints)
- Fundamental limits in and algorithms for sparse recovery
- Analogue-to-information conversion: theory and practice
- Applications of compressive sensing in signal and image acquisition and beyond

- **Theme 3: Information Theory and Radar**
- The history of radar in Britain dates back to the outbreak of the second World War, with radar systems providing the vital information that helped the Royal Air Force win the Battle of Britain. Woodward's book on Probability and Information Theory, with Applications to Radar appeared shortly after Shannon's paper on the Mathematical Theory of Communications.
- Information-theoretic limits of radar
- Super-resolution radar
- Multiple-antenna radar systems
- Weyl-Heisenberg frame theory and radar

Technical Program: Agenda

| 12 Sep. 2016		13 Sep. 2016		14 Sep. 2016	
Track 1: Information Theory, Statistics and Machine Learning (Plenaries and Special Sessions)	Track 2: Regular Contributed Sessions	Track 1: Information Theory and Compressive Sensing (Plenaries and Special Sessions)	Track 2: Regular Contributed Sessions	Track 1: Information Theory and Radar (Plenaries and Special Sessions)	Track 2: Regular Contributed Sessions

The University of Cambridge

- ► Collegiate university founded in 1209
- ► 31 colleges varying in age between 730 years (Peterhouse) and 37 years (Robinson)
- ► Some colleges operate as conference venues outside terms

Robinson College
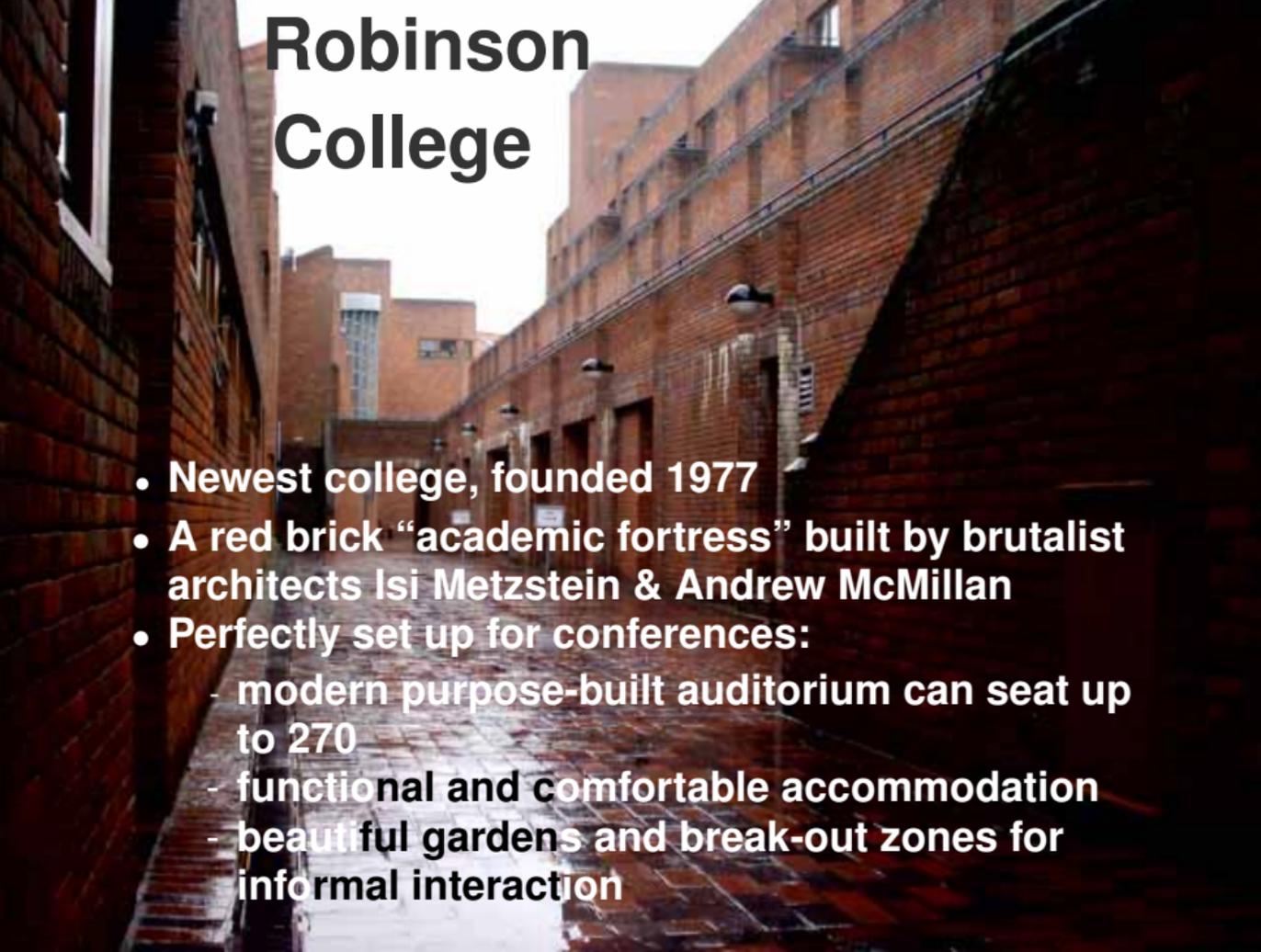
- **Newest college, founded 1977**
- **A red brick "academic fortress" built by brutalist architects Isi Metzstein & Andrew McMillan**
- **Perfectly set up for conferences:**
  - **modern purpose-built auditorium can seat up to 270**
  - **functional and comfortable accommodation**
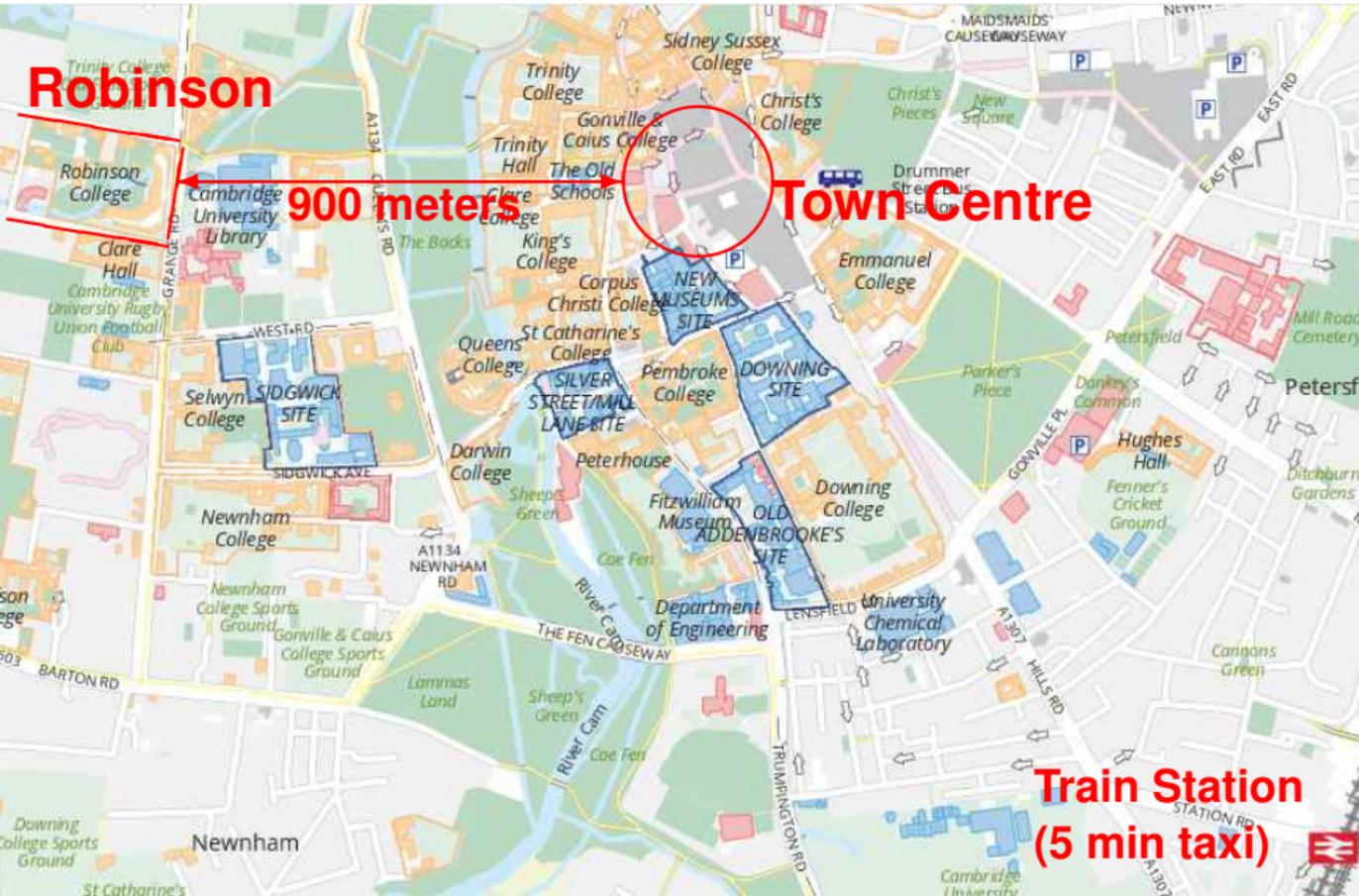 - **beautiful gardens and break-out zones for informal interaction**
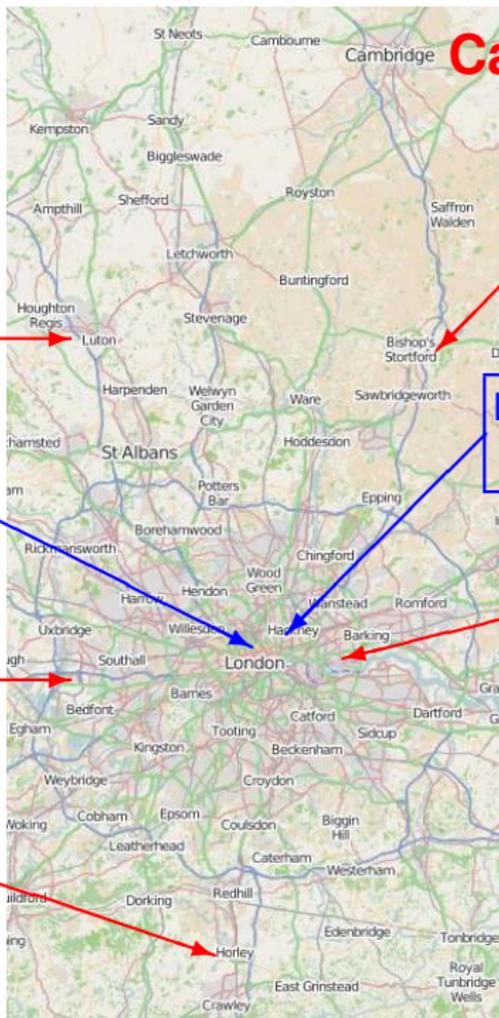
Main Auditorium

The Gardens

Local map

Getting there

Cambridge

Stansted Airport
30 min by taxi
30 min by train

Luton Airport
60 min by taxi
100 min by coach

London Liverpool Street
75 min by train

London Kings Cross
48 min by train

London City Airport
60 min by taxi
100 min by train

Heathrow Airport
75 min by taxi
140 min by train

Gatwick Airport
120 min by taxi
120 min by train

not much further
than most conference
locations in London…

Conference Outline

Sunday, 11 September	arrival, welcome reception at Robinson College
Monday 12 September	sessions all day

Tuesday 13 September	sessions until 4 p.m., followed by:
	  - "walking and punting" excursion to central Cambridge for all attendees
	  - conference dinner in an old college (probably Kings, St. Johns or Pembroke)

Wed. 14 September	sessions all day
Thursday 15 September	optional tours

- Sessions are plenary or 2 parallel
- All lunches included in conference registration. No dinner offered on Monday or Wednesday (option exists).
- Residential accommodation in college encouraged

Registration Fees

Type	Advanced Reg.	Late reg.
Full registration (ITsoc member)	£340 / $580	£390 / $660
Full registration (IEEE non ITsoc)	£410 / $695	£460 / $780
Full registration (non IEEE)	£430 / $730	£480 / $815
Student / IEEE life member	£170 / $290	£220 / $370
Student (non ITsoc)	£220 / $370	£270 / $460

A few things to note when comparing pricing to other conferences:

► conference fee includes lunches, reception on Sunday, excursion, and conference dinner on Tuesday

► we could have included all dinners for a small increment, but chose not to do so because we assume that our participants may need some time away from college

► college accommodation offered at a very competitive rate

► all prices to be charged in GBP, USD prices offered for information only

Conference Budget

Income	160 participants
Registration (75% ITsoc members)	£40,800 / $69,150
Registration (25% students)	£6,800 / $11,525
TOTAL	**£47,600 / $80,675**

Expenditure	160 participants
Venue, all inclusive (lunches, coffees)	£22,464 / $37,821
Reception, conference dinner	£12,800 / $21,550
Included tour	£2,400 / $4,000
Registration pack	£2,800 / $4,700
Payments handling	£2,800 / $4,700
TOTAL	**£43,264 / $73,324**

Surplus: £4,336 / $7,350 (10% of expenditures)

Conference Budget

- College rates are all "per person": essentially all prices scale linearly with the number of participants.
- Minimum residential commitment: 70 rooms (£18,500 / $31,000)
- Minimum attendance commitment: 120 participants (£16,850 / $28,600)
- Total guaranteed commitment: $59,600
- VAT exemption (avoids 20% surcharge on all prices)
- 10% discount on regular college prices
- equivalent to £8,700 / $11,800 public sponsorship through tax rebate, and £2,500 / $4,200 college sponsorship, plus another £4,700 / $7,900 college sponsorship of accommodation on the assumption of 160 people staying in college 4 nights

Accommodation

- College residence encouraged (we want to create the "college feeling" for the workshop!!)
- College B&B rate: £66.15 / $111.35 per night in single en-suite rooms
- B&B rate is VAT exempt and with 10% discount on regular college prices
- College accommodation is decent and functional, approximately equivalent to a 2-3 star hotel
- Conference registration will include an optional "residential package" covering the 4 nights. We may be able to deal with tailored travel plans (depending on the payment system we use).
- For those who can't be persuaded to stay in college, Cambridge has 5-6 very nice 4-star hotels within 10-15 walk / 5 min taxi from the conference venue, with prices starting at £180 / $300 a night, that can all be booked easily on www.visitcambridge.org

Timeline

ITsoc BoG approval	July 2014
Contract signed	December 2014 (!!)
TPC members	December 2014
Website designed	January 2015
Invited speakers	February 2015
Call for papers	March 2015
EDAS ready	November 2015
Submissions accepted	December 2015
Submission deadline	March 2016
Notification	June 2016
Final paper & registration	July 2016
Session chairs	July 2016
Final program	August 2016
Conference	September 2016

See you in Cambridge!