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 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.
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

Track 1: Information Theory, Statistics and Machine Learning (Plenaries and Special Sessions)
Track 2: Regular Contributed Sessions

13 Sep. 2016

Track 1: Information Theory and Compressive Sensing (Plenaries and Special Sessions)
Track 2: Regular Contributed Sessions

14 Sep. 2016

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
Getting there

Cambridge

- Stansted Airport
  - 30 min by taxi
  - 30 min by train

- London Liverpool Street
  - 75 min by train

- London City Airport
  - 60 min by taxi
  - 100 min by train

- Luton Airport
  - 60 min by taxi
  - 100 min by coach

- 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

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sunday, 11 September</td>
<td>arrival, welcome reception at Robinson College</td>
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<tr>
<td>Monday 12 September</td>
<td>sessions all day</td>
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<tr>
<td>Tuesday 13 September</td>
<td>sessions until 4 p.m., followed by:</td>
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<tr>
<td></td>
<td>- “walking and punting” excursion to central Cambridge for all attendees</td>
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<tr>
<td></td>
<td>- conference dinner in an old college (probably Kings, St. Johns or Pembroke)</td>
</tr>
<tr>
<td>Wed. 14 September</td>
<td>sessions all day</td>
</tr>
<tr>
<td>Thursday 15 September</td>
<td>optional tours</td>
</tr>
</tbody>
</table>

- 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

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

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

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Registration (75% ITsoc members)</td>
<td>£40,800 / $69,150</td>
</tr>
<tr>
<td>Registration (25% students)</td>
<td>£6,800 / $11,525</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>£47,600 / $80,675</strong></td>
</tr>
</tbody>
</table>

## Expenditure

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Venue, all inclusive (lunches, coffees)</td>
<td>£22,464 / $37,821</td>
</tr>
<tr>
<td>Reception, conference dinner</td>
<td>£12,800 / $21,550</td>
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<tr>
<td>Included tour</td>
<td>£2,400 / $4,000</td>
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<tr>
<td>Registration pack</td>
<td>£2,800 / $4,700</td>
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<tr>
<td>Payments handling</td>
<td>£2,800 / $4,700</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>£43,264 / $73,324</strong></td>
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</tbody>
</table>

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.visitchina.org
<table>
<thead>
<tr>
<th>Event</th>
<th>Date</th>
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<tbody>
<tr>
<td>ITsoc BoG approval</td>
<td>July 2014</td>
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<tr>
<td>Contract signed</td>
<td>December 2014</td>
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<td>TPC members</td>
<td>December 2014</td>
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<tr>
<td>Website designed</td>
<td>January 2015</td>
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<tr>
<td>Invited speakers</td>
<td>February 2015</td>
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<tr>
<td>Call for papers</td>
<td>March 2015</td>
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<tr>
<td>EDAS ready</td>
<td>November 2015</td>
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<tr>
<td>Submissions accepted</td>
<td>December 2015</td>
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<tr>
<td>Submission deadline</td>
<td>March 2016</td>
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<tr>
<td>Notification</td>
<td>June 2016</td>
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<tr>
<td>Final paper &amp; registration</td>
<td>July 2016</td>
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<tr>
<td>Session chairs</td>
<td>July 2016</td>
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<tr>
<td>Final program</td>
<td>August 2016</td>
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<tr>
<td>Conference</td>
<td>September 2016</td>
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</tbody>
</table>
See you in Cambridge!