

# The CWI World Cup Competition: Eliciting Sets of Acceptable Gambles

**Erik Quaeghebeur** Chris Wesseling

Emma Beauxis-Aussalet Teresa Piovesan Tom Sterkenburg

ISIPTA '17



*“[. . .], we need to acknowledge imprecision in elicitation. The idea of upper and lower probabilities is very natural in this context.”*

O'Hagan & Oakley (2004)

*“[...] , we need to acknowledge imprecision in elicitation. The idea of upper and lower probabilities is very natural in this context.”*

O'Hagan & Oakley (2004)

*“TRUE PROBABILITY DOES NOT EXIST  
[...] THIS IS NOT A PROBLEM”*

Nau (2001)

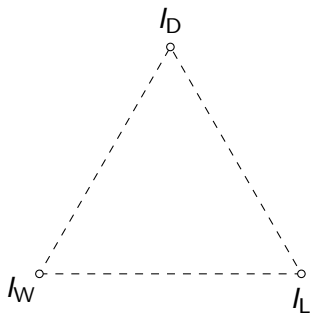
## **Sets of Acceptable Gambles**

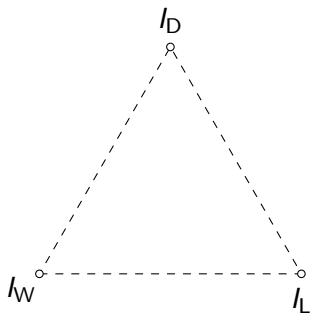


$I_D$   
○

$I_W$   
○

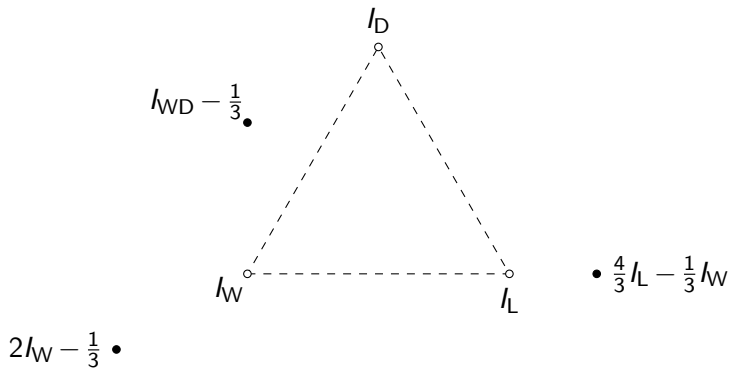
$I_L$   
○

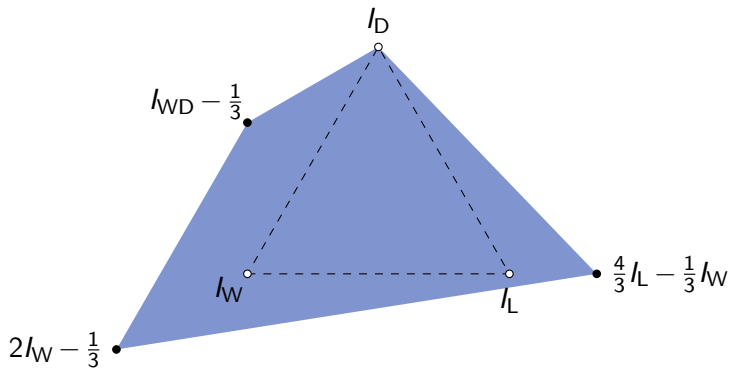




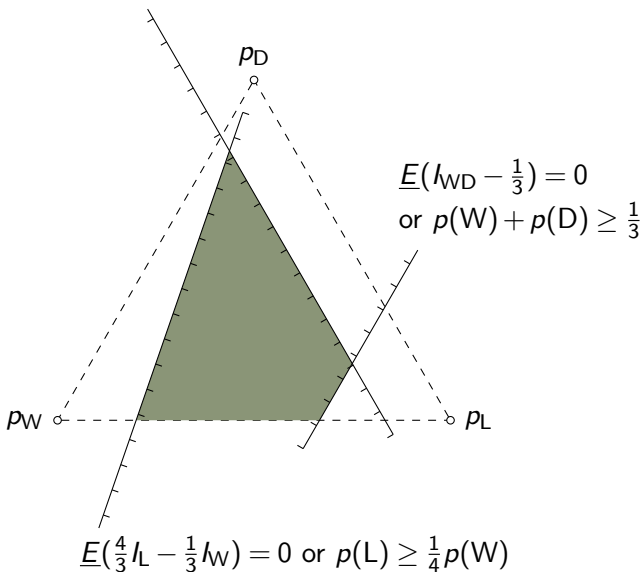
$$2I_W - \frac{1}{3} \bullet$$







$$\underline{E}(2I_W - \frac{1}{3}) = 0 \text{ or } p(W) \geq \frac{1}{6}$$

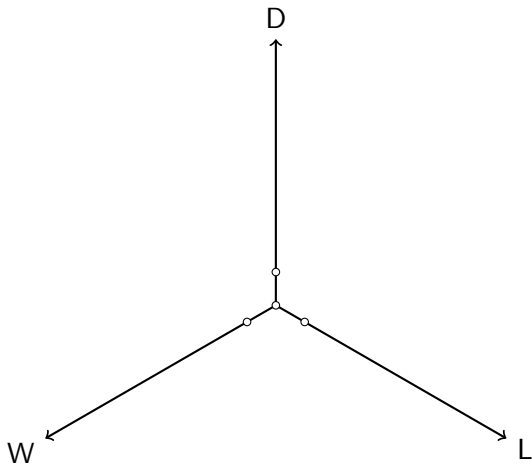


# The Elicitation Interface

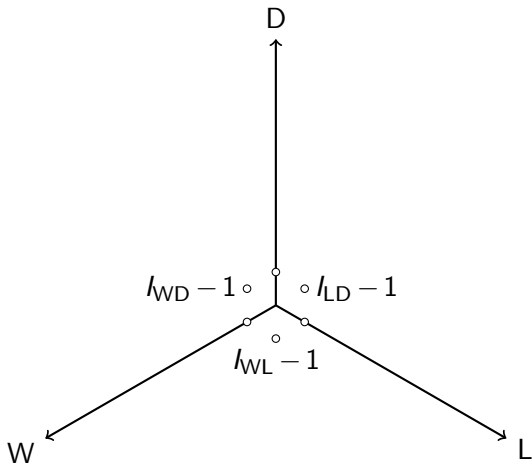


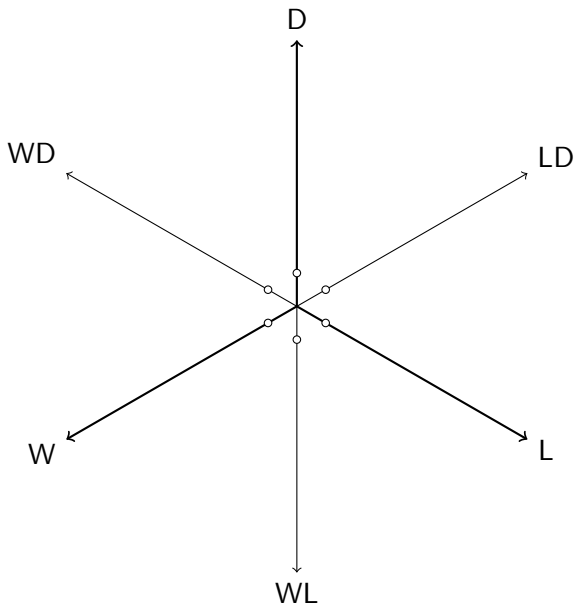
o -1

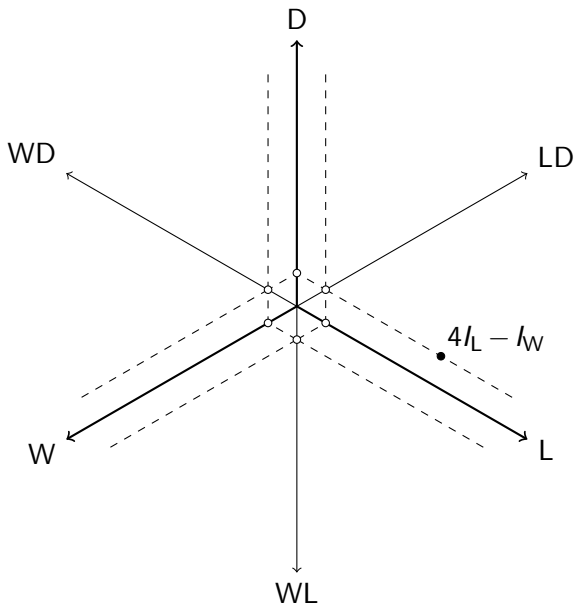
$$\begin{array}{ccc} & & I_D - 1 \\ & & \circ \\ & \circ & \\ I_W - 1 & & \circ \\ & & I_L - 1 \end{array}$$

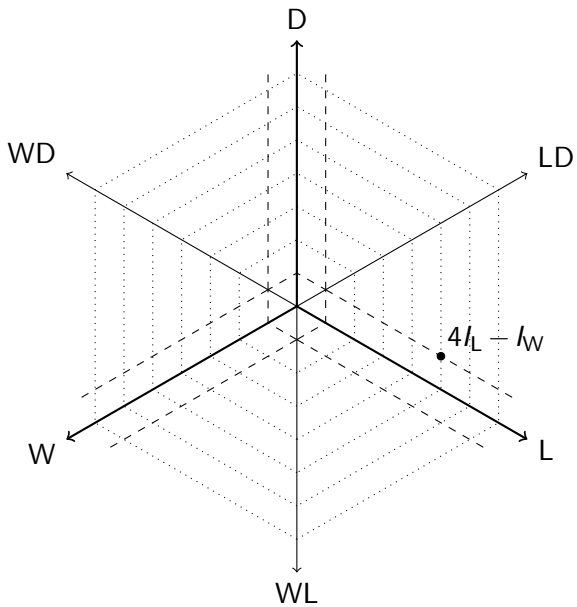


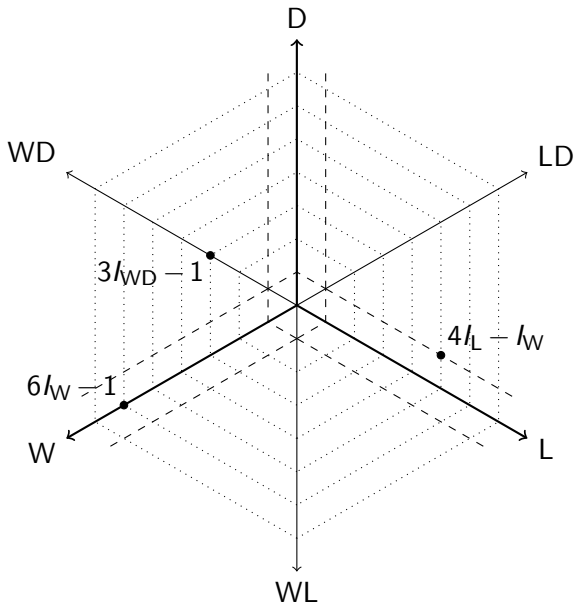


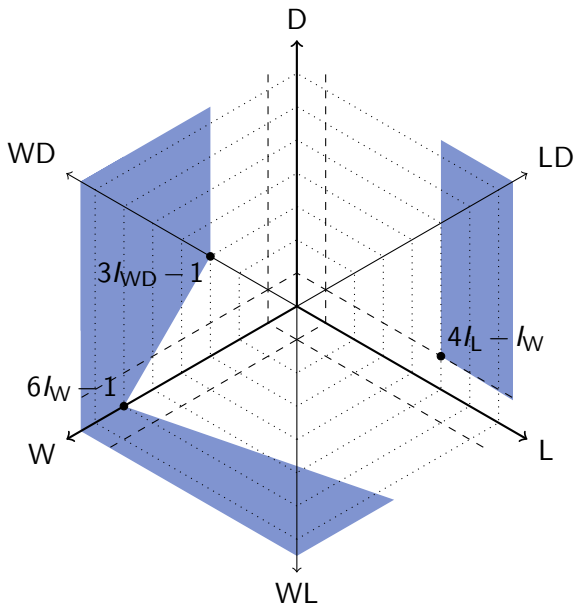


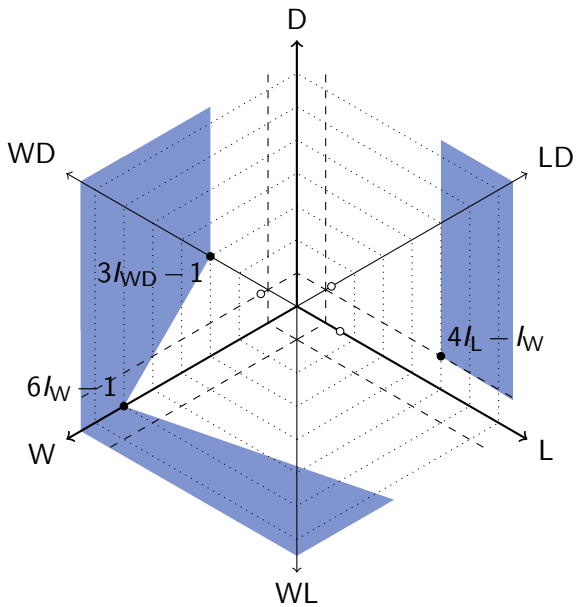


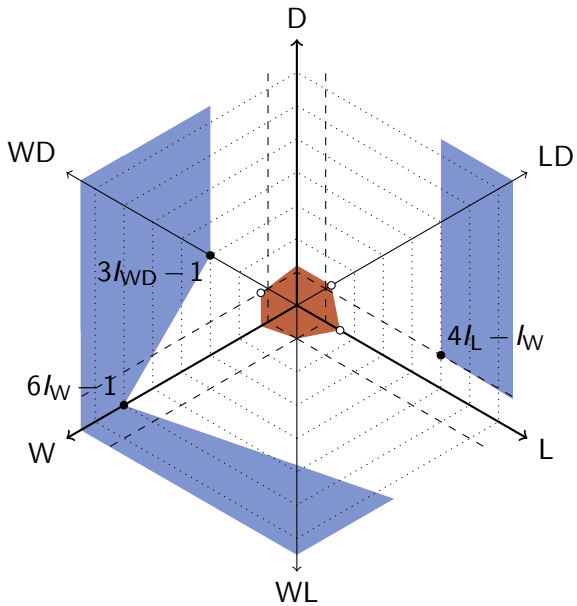




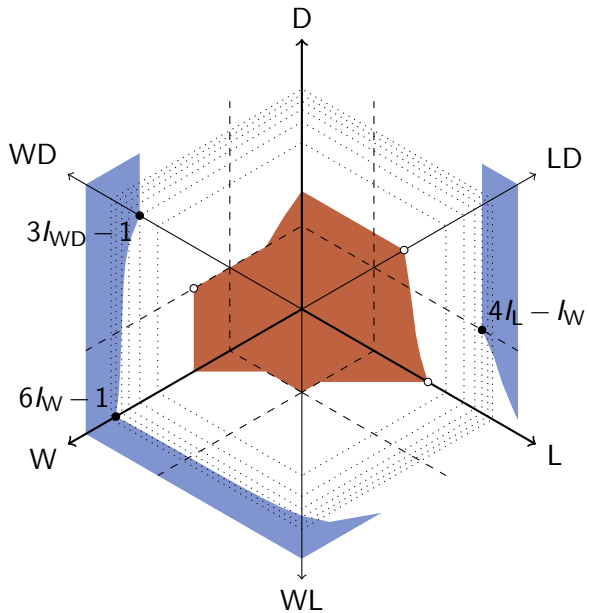


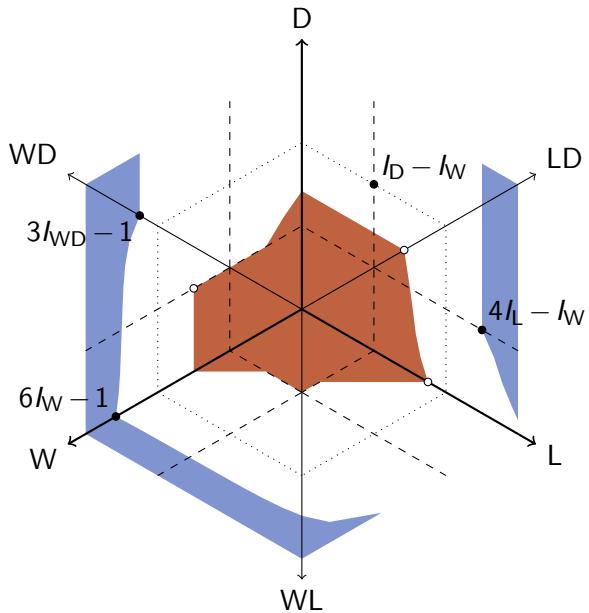


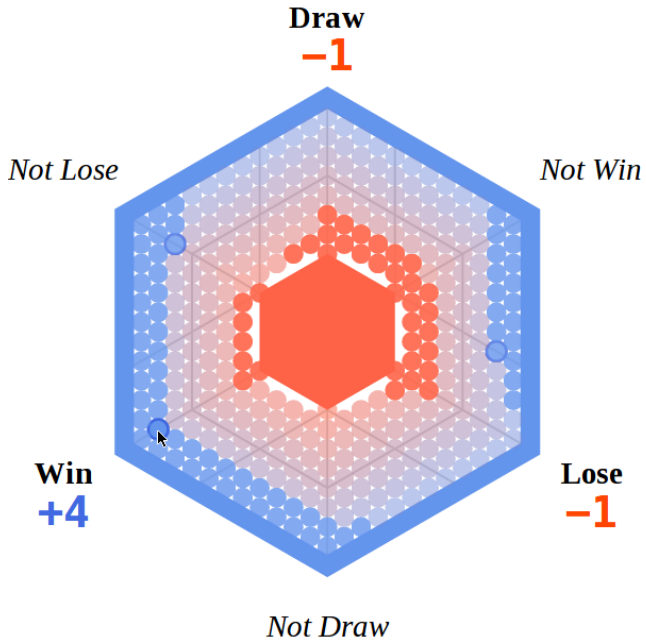












# The Experiment



**FIFA WORLD CUP**  
**BRASIL**

## About this game

## About you (completely optional)

### Results of Played Matches

losses: **-5.26** winnings: **9.18**

Thu 12 Jun: <b>BRA</b> - CRO	Fri 13 Jun: <b>MEX</b> - CMR	Fri 13 Jun: <b>ESP</b> - NED
Sat 14 Jun: <b>CHI</b> - AUS	Sat 14 Jun: <b>COL</b> - GRE	Sat 14 Jun: <b>URU</b> - CRC
Sun 15 Jun: <b>ENG</b> - ITA	Sun 15 Jun: <b>CIV</b> - JPN	Sun 15 Jun: <b>SUI</b> - ECU
Sun 15 Jun: <b>FRA</b> - HON	Mon 16 Jun: <b>ARG</b> - BIH	Mon 16 Jun: <b>GER</b> - POR
Mon 16 Jun: <b>IRN</b> - NGA	Tue 17 Jun: <b>GHA</b> - USA	Tue 17 Jun: <b>BEL</b> - ALG
Tue 17 Jun: <b>BRA</b> - MEX	Wed 18 Jun: <b>RUS</b> - KOR	Wed 18 Jun: <b>AUS</b> - NED
Wed 18 Jun: <b>ESP</b> - CHI	Thu 19 Jun: <b>CMR</b> - CRO	Thu 19 Jun: <b>COL</b> - CIV
Thu 19 Jun: <b>URU</b> - ENG	Fri 20 Jun: <b>JPN</b> - GRE	Fri 20 Jun: <b>ITA</b> - CRC
Fri 20 Jun: <b>SUI</b> - FRA	Sat 21 Jun: <b>HON</b> - ECU	Sat 21 Jun: <b>ARG</b> - IRN
Sat 21 Jun: <b>GER</b> - GHA	Sun 22 Jun: <b>NGA</b> - BIH	Sun 22 Jun: <b>BEL</b> - RUS
Sun 22 Jun: <b>KOR</b> - ALG	Mon 23 Jun: <b>USA</b> - POR	Mon 23 Jun: <b>AUS</b> - ESP 1.0
Mon 23 Jun: <b>NED</b> - CHI	Mon 23 Jun: <b>CMR</b> - BRA	Mon 23 Jun: <b>CRO</b> - MEX 0.46
Tue 24 Jun: <b>ITA</b> - URU 1.0	Tue 24 Jun: <b>CRC</b> - ENG	Tue 24 Jun: <b>JPN</b> - COL
Tue 24 Jun: <b>GRE</b> - CIV	Wed 25 Jun: <b>BIH</b> - IRN	Wed 25 Jun: <b>NGA</b> - ARG
Wed 25 Jun: <b>HON</b> - SUI	Wed 25 Jun: <b>ECU</b> - FRA	Thu 26 Jun: <b>POR</b> - GHA
Thu 26 Jun: <b>USA</b> - GER	Thu 26 Jun: <b>KOR</b> - BEL	Thu 26 Jun: <b>ALG</b> - RUS
Sat 28 Jun: <b>BRA</b> - CHI 1.25	Sat 28 Jun: <b>COL</b> - URU 0.85	Sun 29 Jun: <b>NED</b> - MEX -0.88
Sun 29 Jun: <b>CRC</b> - GRE	Mon 30 Jun: <b>FRA</b> - NGA -0.06	Mon 30 Jun: <b>GER</b> - ALG -0.53
Tue 1 Jul: <b>ARG</b> - SUI 1.35	Tue 1 Jul: <b>BEL</b> - USA -1.0	Fri 4 Jul: <b>FRA</b> - GER -1.0
Fri 4 Jul: <b>BRA</b> - COL	Sat 5 Jul: <b>ARG</b> - BEL 1.55	Sat 5 Jul: <b>NED</b> - CRC -0.79
Tue 8 Jul: <b>BRA</b> - GER	Wed 9 Jul: <b>NED</b> - ARG	Sat 12 Jul: <b>BRA</b> - NED 1.73
Sun 13 Jul: <b>GER</b> - ARG -1.0		

### Gamble on Upcoming Matches

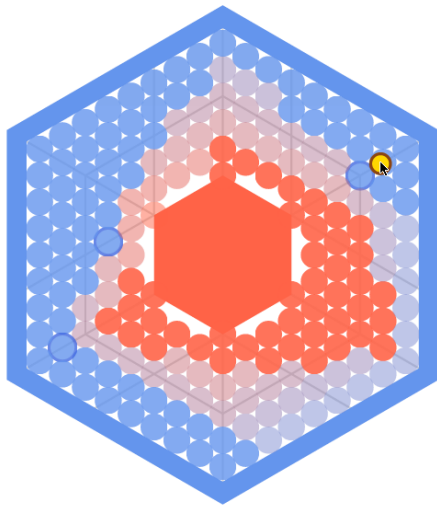
expected winnings: **≥0.0**

Penalty Shootout

1.86

*Not ARG*

*Not GER*



GER  
-1

ARG  
1.86

*Not Penalty Shootout*





## **Conclusions & Recommendations**

*“Yes we can!”*

Bob the Builder (1998), Obama (2008), . . .

*“Yes we can!”*

Bob the Builder (1998), Obama (2008), . . .

*“Everything should be as simple as it can be,  
but not simpler.”*

Attributed to Einstein (1950s)



**FIFA WORLD CUP**  
**RUSSIA 2018**

## **Extra material**

