Analysing the Castellers network

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Complex Netowrks

Final Project

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Outline

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Collect real data from the Castells topic

Build a new dataset

Modelling Castells crews scenario as a Complex Network

Representing play-with interactions

Learn interesting information from the model analysis

Knowledge extraction

Outline

Motivation

Problem statement and goals

Working on current real data

Facing a real problem

Promoting local topics

Usually are not target for investigation

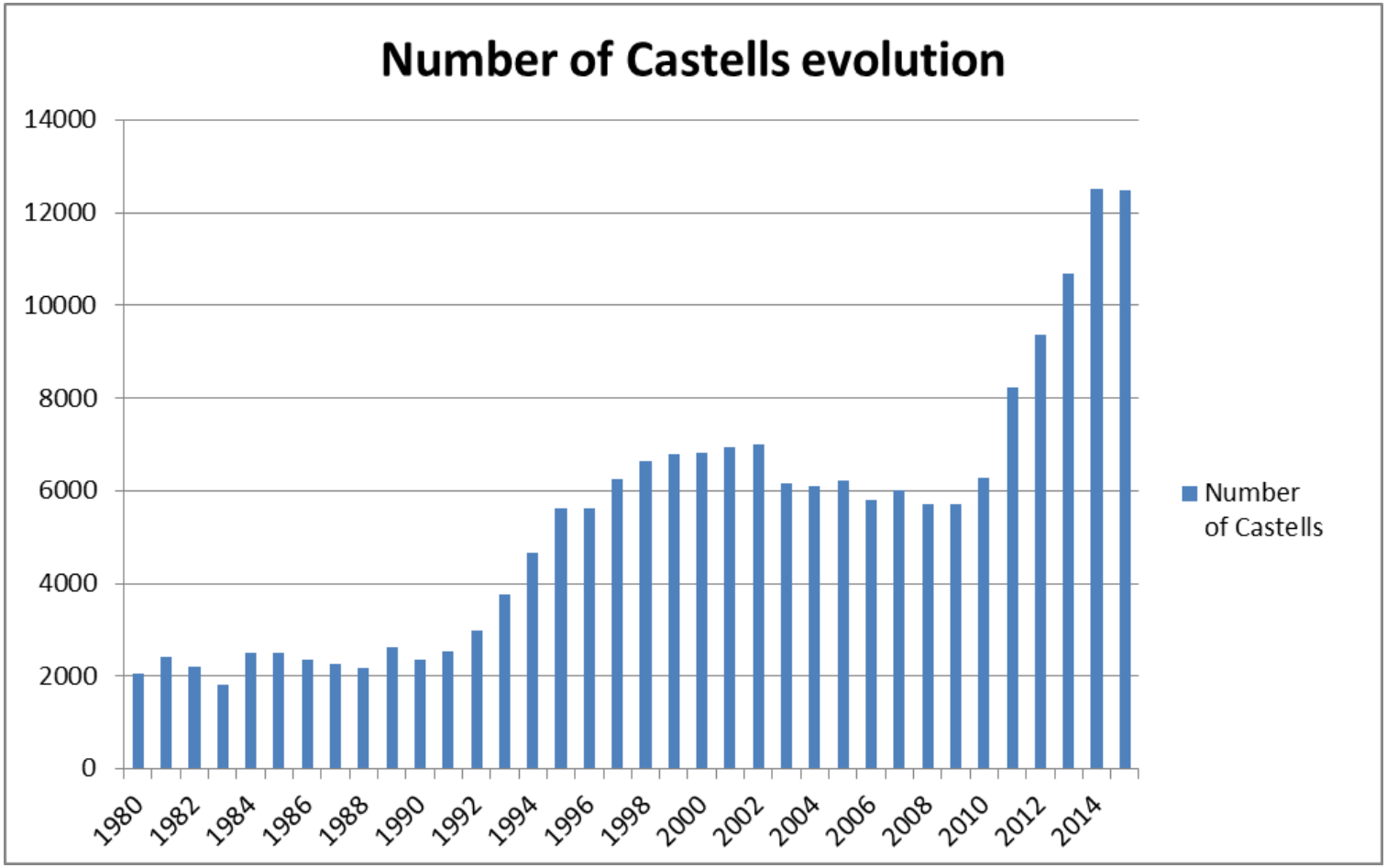
Presenting results for possible real applications

Outline

The target scenario

Problem statement and goals

The First raise | The depression | The platinum period



(1991 - 2002) | (2003 - 2009) | (2010 - 2015)

Outline

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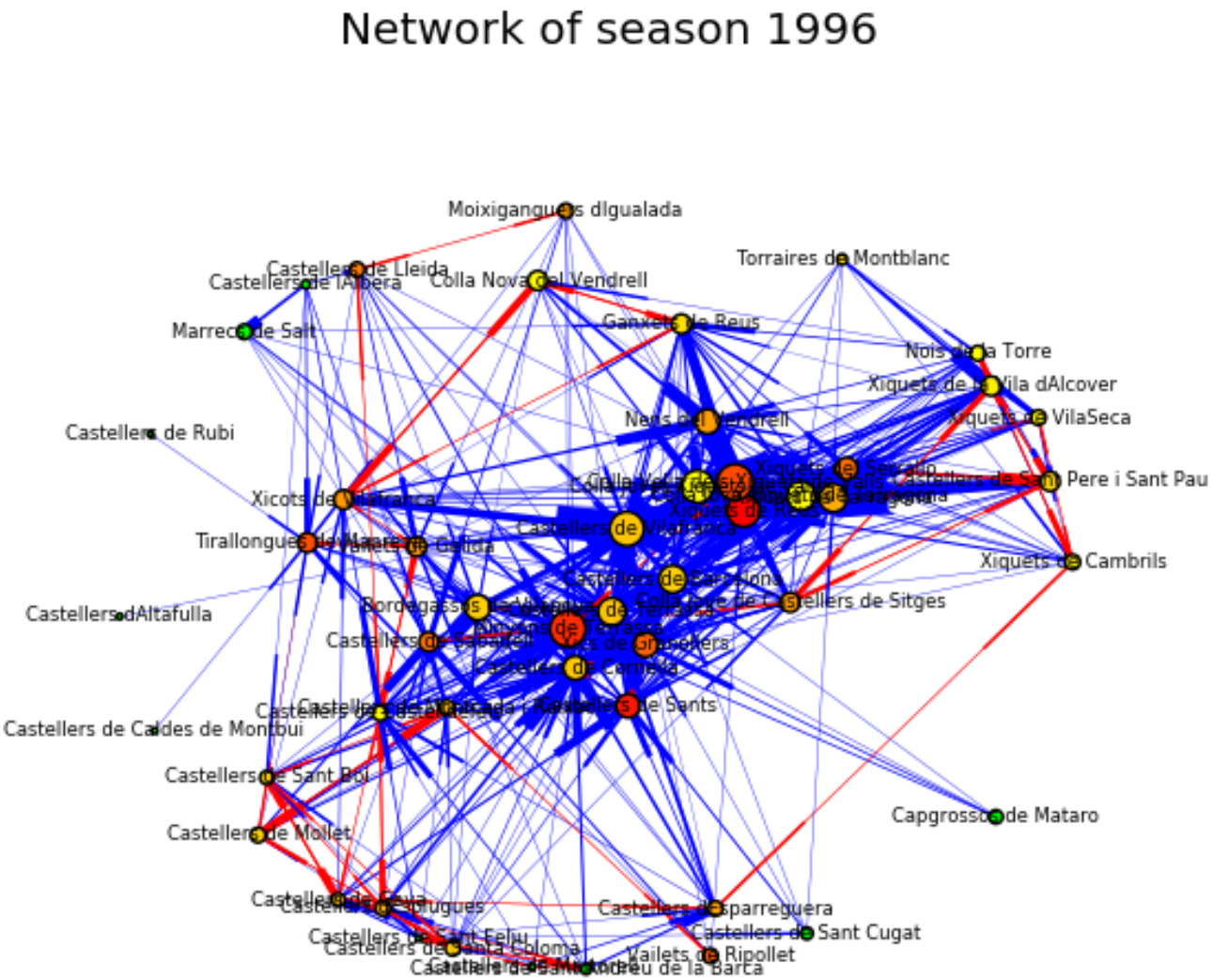
Overall definition

- **Description:** Complete activity records
- **Time period:** From 01/01/1990 to 31/12/2015
- **Sources:** [BDC] and [por]
- **Number of instances:** 33314

Instance Structure

1. Date
2. Location
3. Name of the event
4. Name of the crew
5. Results

Outline


Network of season 1996
Moixiganguers dIgualada
Castellers de Lleida
Castellers de l'Albera
Colla Nova del Vendrell
Torraires de Montblanc
Marrecs de Salt
Ganxets de Reus
Nois de la Torre
Xiquets de Vila dAlcover
Castellers de Rubi
Xiquets de VilaSeca
Xicots de Vilafranca
Castellers de Vilafranca
Tirallongues de Tarragona
Xiquets de Cambrils
Castellers de Barcelona
CastellersdAltafulla
Castellers de Sitges
Castellers de Cornella
Castellers de Sants
Castellers de Caldes de Montbui
Castellers de Sant Boi
Capgrossos de Mataro
Castellers de Mollet
Castellers de Sparreguera
Castellers de Sant Cugat
Castellers de Sant Feliu
Vailets de Ripollet

Outline

Castell value

$$V(ht) = ROW(ht) \tag{1}$$

Level

$$level(a_s) = V(a_{s_{ht_{top}}}) \tag{2}$$

Growth

$$G(a_s) = level(a_s) - level(a_{s-1}) \tag{3}$$

Unsafeness

$$U(a_s) = \frac{\sum_{j=1}^{m} F(a_s, a_{s_{t_j}})}{n}$$

$$\forall r_{ij} \in a_{s_t} = \{a_{s_{t_1}}, a_{s_{t_2}}, ..., a_{s_{t_m}}\} \tag{4}$$

$$F(a_s, x) = \begin{cases} 0 & \text{when trial } x \text{ did not fall,} \\ 2^{D(a_s,x)} & \text{when trial } x \text{ did fall} \end{cases} \tag{5}$$

$$D(a_s, x) = max(0, V(x) - level(a_s)) \tag{6}$$

Outline

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Design strategy

Analysis

Pre-analysis $\rightarrow$ Generic analysis

- Degree distribution analysis
- Community detection analysis

First analysis $\rightarrow$ Target goals

- Correlating interactions between crews to performance evolution

Second analysis $\rightarrow$ Extension

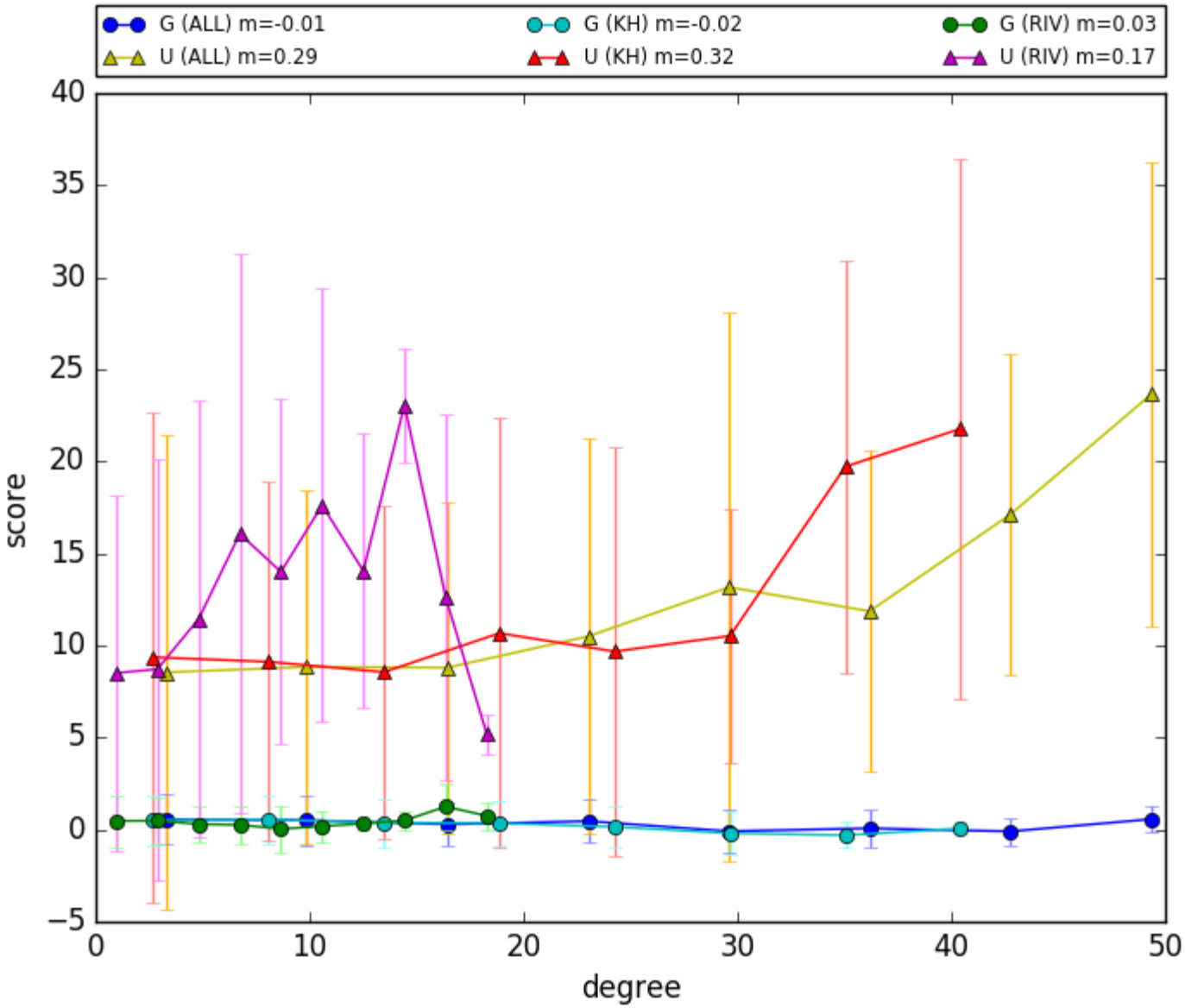
- Correlating extreme performances to other attributes

Outline

Outline

First analysis

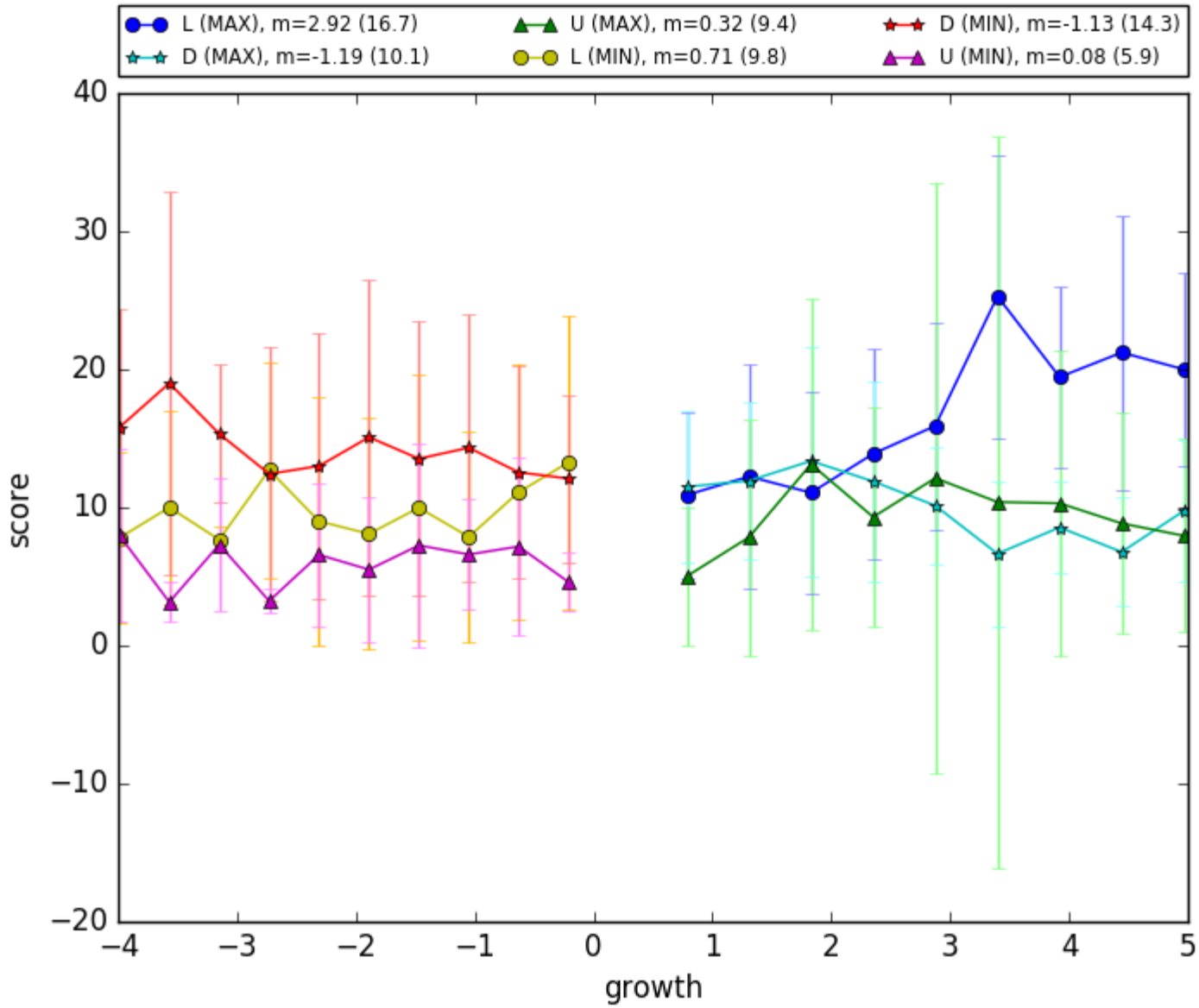
Results



Outline

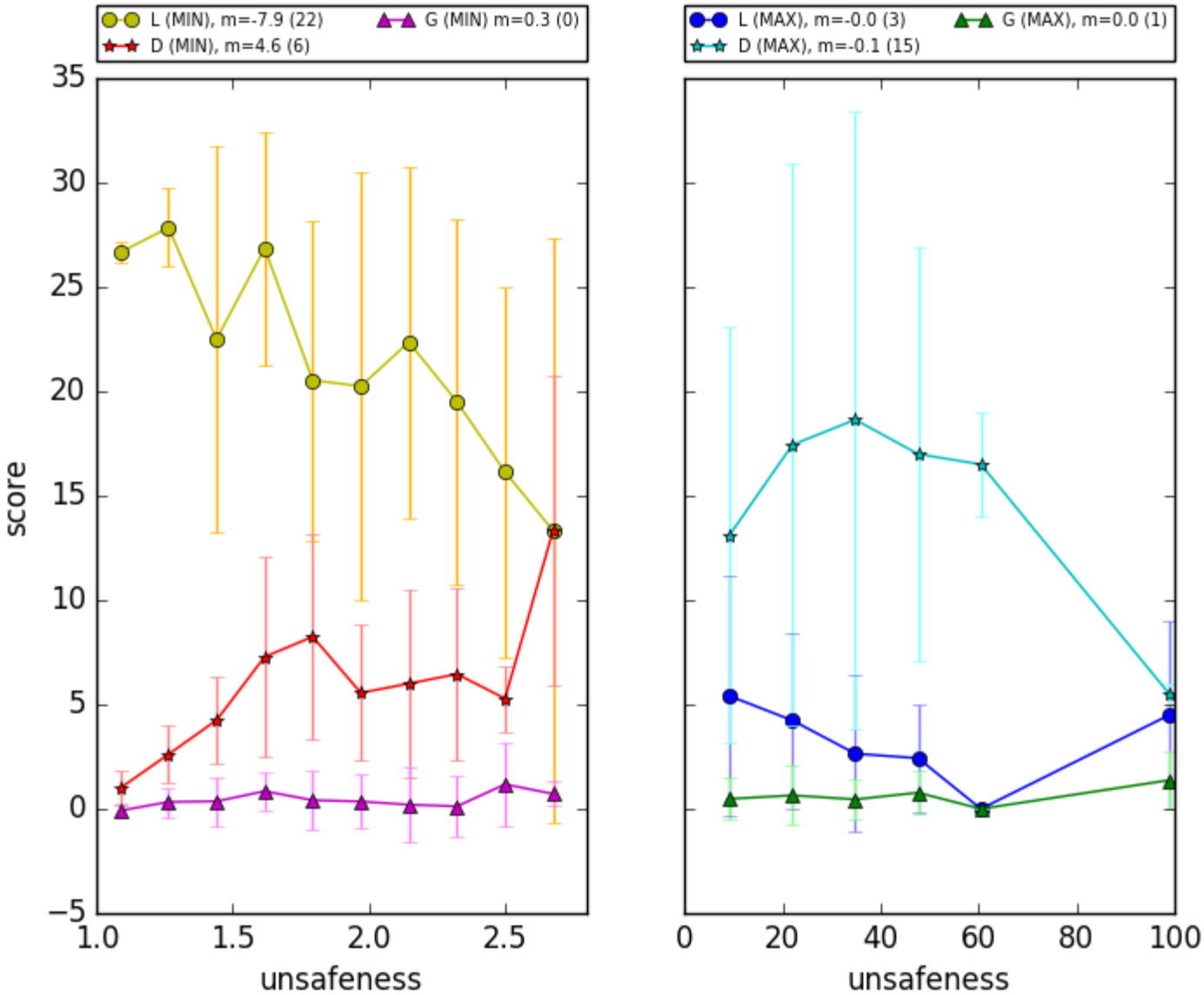
Second analysis (1/2)

Results



Second analysis (2/2)

Results



Summary

Contributions of the paper

- Presents a new dataset containing the full activity of *Castells* from 1990 to 2015
- Implements a complex network model of the *Castells* crews
- Extracts new knowledge from the model by means of applying two different analysis

References I


BDCJ, base de dades de la coordinadora de colles castelleres de catalunya colla jove xiquets de tarragona, `http://www.cccc.cat/base-de-dades`, Accessed: 08-05-2016.


S. Boccaletti, V. Latora, Y. Moreno, M. Chavez, and D.-U. Hwang, *Complex networks: Structure and dynamics*, Physics Reports **424** (2006), no. 45, 175 – 308.


CCCC, coordinadora de colles castelleres de catalunya, `http://www.cccc.cat/`, Accessed: 08-05-2016.


Concurs, official site, `http://www.concursdecastells.cat/inici`, Accessed: 10-05-2016.


Aaron Clauset, Cosma Rohilla Shalizi, and M. E. J. Newman, *Power-law distributions in empirical data*, SIAM Rev. **51** (2009), no. 4, 661–703.

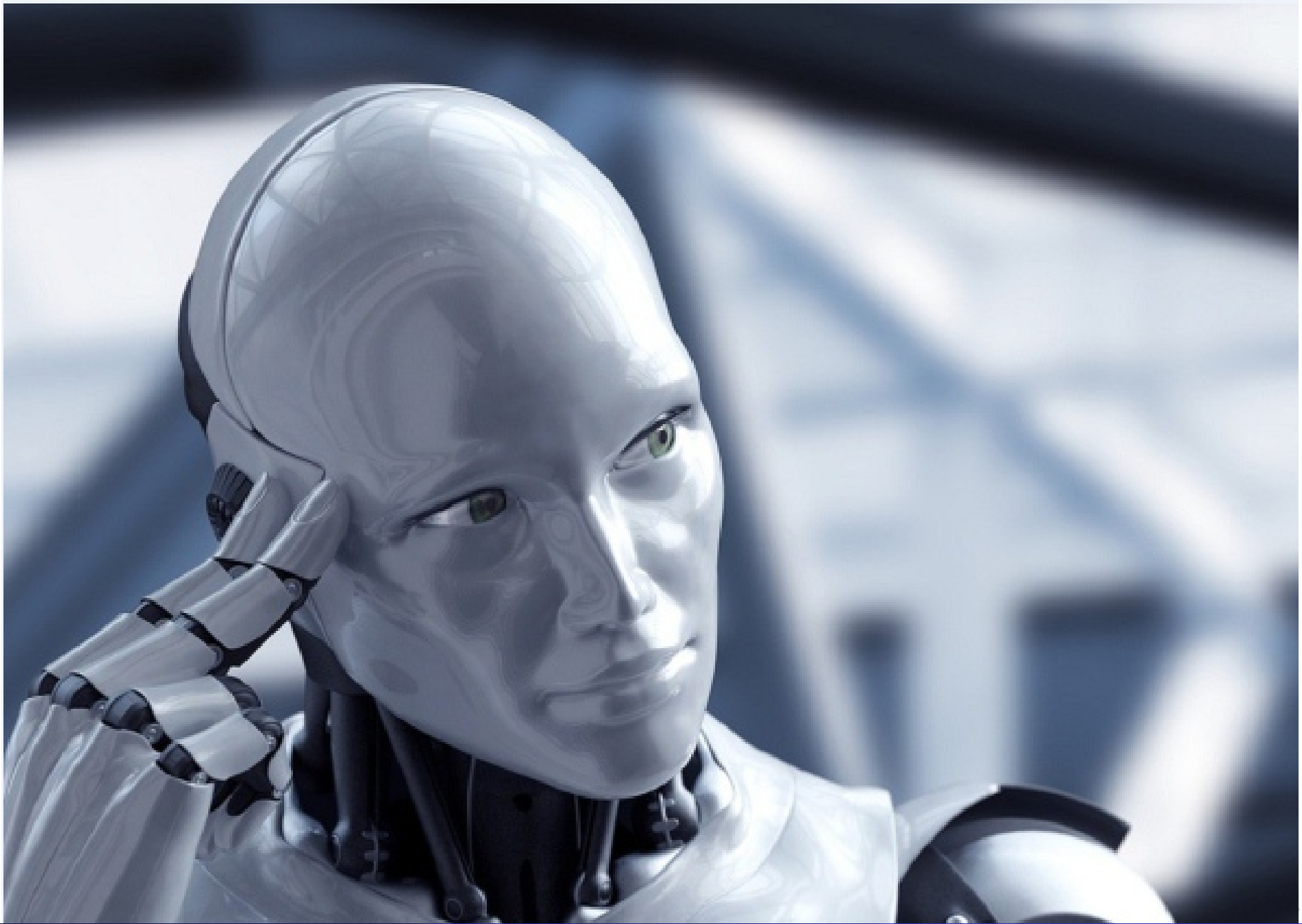
References II


M. E. J. Newman, *The structure and function of complex networks*, SIAM REVIEW **45** (2003), 167–256.


Concurs, points metrics, `http://www.concursdecastells.cat/taula-de-puntuacions-1-cdc`, Accessed: 08-05-2016.


Portalcasteller, `http://www.portalcasteller.cat/`, Accessed: 08-05-2016.

THANK YOU FOR YOUR ATTENTION



QUESTIONS?