Identifying the greatest team and captain — A complex network approach to cricket matches
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Abstract

We consider all Test matches played between 1877 and 2010 and One Day International (ODI) matches played between 1971 and 2010. We form directed and weighted networks of teams and also of their captains. The success of a team (or captain) is determined by the ‘quality’ of wins and not on the number of wins alone. We apply the diffusion based PageRank algorithm on the networks to access the importance of wins and rank the teams and captains respectively. Our analysis identifies Australia as the best team in both forms of cricket — Test and ODI. Steve Waugh is identified as the best captain in Test cricket and Ricky Ponting is the best captain in the ODI format. We also compare our ranking scheme with the existing ranking schemes which include the Reliance ICC Ranking. Our method does not depend on ‘external’ criteria in ranking of teams (captains). The purpose of this paper is to introduce a revised ranking of cricket teams and to quantify the success of the captains.

1 Introduction

The study of social networks, representing interactions between humans or groups, is a subject of broad research interest. In recent years, tools from network analysis have been applied to sports. For example, Duch, Waitzman, and Amaral (2010) developed a network approach to quantify the performance of individual players in soccer. Önody and de Castro (2004) studied the complex network structure of Brazilian soccer players. Heuer, Müller, and Rubner (2010) introduced a general model-free approach to elucidate the outcome of a soccer match. Network analysis tools have been applied to football (Girvan and Newman (2002); Ben-Naim, Vazquez, and Redner (2007b)), baseball (Petersen, Jung, and Stanley (2008); Sire and Redner (2009)) and basketball (Ben-Naim, Redner, and Vazquez (2007a); Skinner (2010)). Saavedra, Powers, McCotter, Porter, and Mucha (2009) studied the head-to-head matchups between Major League Baseball pitchers and batters.
as a bipartite network (Gross and Yellen (2004)). The advantage of a network representation of any real system is that it gives the global view of the entire system and the interaction between individuals reflecting self-emergent phenomena.

In this paper we apply tools of social network analysis to cricket. Cricket is a popular sport around the world and is played mostly in the erstwhile English colonies. Its popularity is the highest in the Indian subcontinent. Despite series of controversies involving match fixing, spot fixing and ball tampering, the sport has managed to maintain international attention as well research interests (Bailey and Clarke (2004), Borooah and Mangan (2010), Bracewell and Ruggiero (2009)). Currently there are ten countries that have been granted Test status by International Cricket Council (ICC) - Australia (AUS), Bangladesh (BAN), England (ENG), India (IND), New Zealand (NZ), Pakistan (PAK), South Africa (SA), Sri Lanka (SL), West Indies (WI) and Zimbabwe (ZIM). The Reliance ICC Rankings is the official guide used to evaluate the performance of teams as well as the players. Ranking schemes are based on points that are acquired by a team after a tournament. As mentioned by Borooah and Mangan (2010), due to the opacity of the ranking schemes, the methods used by ICC are still not comprehensible. Again in cricket the captain is responsible for the team. Before the game starts the home captain tosses the coin and the touring captain calls heads or tails. The captain chooses the batting order, sets up fielding positions and shoulders the responsibility of on-field decision-making. Thus the outcome of a match depends on the captain’s decisions. Additionally, the captain is also responsible at all times for ensuring that play is conducted within the Spirit of the Game as well as within the Laws. In this sense, the success of a team depends on the captain. However, currently there exist no ranking schemes to rank the cricket captains.

In this paper we numerically estimate the success of a team as well as the captain by analyzing the network of interaction of competing teams and also the captains. The primary goal of the paper is to elucidate the impact of network structure on rankings of teams and also that of the cricket captains. While the number of wins is a natural measure for success of a team, it does not provide a full picture of the ‘quality’ of win. We are thus motivated to study an alternative method to assess the quality of a win. For example, a win against Australia or South Africa carries more importance than a win against a lesser team. This is analogous to the citation networks in which the effect of citation coming from an important paper is greater than that coming from a less popular one. The PageRank algorithm (Brin and Page (1998)), a network-diffusion-based algorithm has emerged as leading method to rank scientists (Radicchi, Fortunato, Markines, and Vespignani (2009)), papers (Chen, Xie, Maslov, and Redner (2007)). More recently Radicchi

\[ \text{http://www.lords.org/laws-and-spirit/laws-of-cricket/preamble-to-the-laws,475,ar.html} \]
applied PageRank algorithm to rank tennis players. In this paper we apply the PageRank algorithm to rank cricket teams and also identify the most successful cricket captain. The rest of the paper is organized as follows. In Section 2, we define and characterize the cricket-team network and provide a description of the PageRank algorithm that we employ as a ranking scheme across eras and also in the history of cricket (1877 – 2010). In Section 3, we discuss the results and we conclude in Section 4.

2 Network of Cricket Teams

Data were collected from the website of cricinfo (http://www.espncricinfo.com). We downloaded the information of results and also the captains who led their respective teams from the score-cards. For a single match, the score-card keeps track of information about the teams, the runs scored by batsmen, wickets taken by bowlers, the names of captains who led their respective teams and the result of a
match. We collected the data for Test matches (1877–2010) and One Day International (ODI) cricket (1971–2010). In our analysis we have excluded the matches with no results and matches which were abandoned.

We analyze the network of cricket teams by analyzing the head-to-head encounter of competing teams. A single match is represented by a link between two opponents. Thus if team \( i \) wins against team \( j \), a directed link is drawn from \( j \) to \( i \) (Figure 1). A weighted representation of the directed network is obtained by assigning a weight \( w_{ji} \) to the link, where \( w_{ji} \) is equal to the fraction of times team \( j \) wins against team \( i \). We quantify the relevance of matches with the use of a complex network approach equivalent to the one used for the computation of the PageRank score. Mathematically, the process is described by the following set of equations

\[
p_i = (1 - q) \sum_j p_j \frac{w_{ji}}{s^\text{out}_j} + \frac{q}{N} + \frac{1 - q}{N} \sum_j \delta\left(s^\text{out}_j\right),
\]

where \( w_{ji} \) is the weight of a link and \( s^\text{out}_j = \sum_i w_{ij} \) is the out-strength of a link. \( p_i \) is the PageRank score assigned to team \( i \) and represents the fraction of the overall “influence” sitting in the steady state of the diffusion process on vertex \( i \) (Radicchi (2011)). In Eqs. (1), \( q \in [0, 1] \) is a control parameter that accounts for the importance of the various terms contributing to the score of the nodes and \( N \) is the total number of teams in the network. The term \( (1 - q) \sum_j p_j \frac{w_{ji}}{s^\text{out}_j} \) represents the portion of the score received by node \( i \) in the diffusion process according to the hypothesis that vertices redistribute their entire credit to neighboring nodes. \( \frac{q}{N} \) stands for a uniform redistribution of credit among all nodes. The term \( \frac{1 - q}{N} \sum_j p_j \delta\left(s^\text{out}_j\right) \) serves as a correction in the case of the existence of dangling nodes (i.e., nodes with null out-degree), which otherwise would behave as sinks in the diffusion process.

3 Results

Traditionally, the choice of \( q \) is set at 0.15 (Brin and Page (1998)). Hence, we set \( q = 0.15 \) and run the ranking scheme on networks of cricket teams and also on their captains. In Table 1 we report the results obtained from analysis of network of cricket teams for Test cricket. We identify Australia as the most successful team in history of Test cricket. Even though South Africa was banned from playing international cricket from 1970–1991, it emerges as the second best team followed by England, West Indies, Pakistan, India, Sri Lanka, New Zealand, Zimbabwe and Bangladesh. Table 2 shows the ranking of teams in history of ODI cricket (1971–2010). Again, Australia emerges as the best ODI team ever followed by South Africa, West Indies, England, Pakistan, India, New Zealand, Sri
Pakistan, Australia and Bangladesh. The success of Australia could be justified by the dominance of Australia in International cricket for a long period of time. Australia won test series in all the countries and also won four ICC World cups in 1987, 1999, 2003 and 2007.

We also report the results obtained from the analysis of the network of competing captains (See Table 3). Steve Waugh heads the top 20 list of most successful captains in Test cricket. The success of Steve Waugh could be posteriori justified by the fact that he led Australia in 15 of their world-record 16 successive Test victories. Over all Steve Waugh won 72% of the Test matches he captained. It is interesting to note that 8 of the top 20 captains are from Australia. South Africa’s Graeme Smith emerges as the second best captain with Ricky Ponting occupying the third position. From the subcontinent only India’s M. S. Dhoni and Sourav Ganguly finds a place in the top 20 list. We also perform a similar analysis in ODI cricket (See Table 4). This time Ricky Ponting emerges as the best captain in ODI history, followed by Graeme Smith (South Africa) in second place and Imran Khan (Pakistan).
Figure 3. Subgraph of the network of most successful captains in the history of Test cricket (1877 – 2010).

in the third. Ricky Ponting’s success as a captain in the ODI format is marked by two successive World Cup wins in 2003 and 2007, with a world-record of 34 consecutive undefeated World Cup games. Under his captaincy Australia also won the Champions trophy in 2006 and successfully defended the title in 2009. Contrary to the list in Test cricket, several of the successful captains in the ODI format are from the subcontinent.

We also perform a different kind of analysis by constructing networks of teams and their captains in different eras. In Table 5 and Table 6 we report the ranking of teams in different era of Test cricket respectively. We compare our ranking with Reliance ICC Team Ranking\(^2\). The table of historical ranking of teams, available at ICC’s website (http://icc.cricket.yahoo.net/match_zone/historical_ranking.php), begins from 1951 for Test cricket and from 1981 for ODI cricket. We rank the teams according to the average of the points scored by any team.

During the period 1877 – 1951, Australia emerged as the most successful team. Between 1952 and 1960 Australia was the most successful team according to the PageRank algorithm and also ICC’s ranking scheme. During 1961 – 1970 West Indies was the best team according to ICC ranking. Even though the early 1960s were poor periods for England, during the late 60’s England defeated stronger opponents

\(^2\) The Reliance ICC Team Rankings were launched for ODI cricket in 2002 and for Test cricket in 2003.
like West Indies and Australia. Hence judging by the quality of wins, according to PageRank during 1961 − 1970 England was the most successful team. A similar effect is also observed during the 1971 − 1980 era, where India occupies the second position according to PageRank. During the same period India defeated stronger opponents like West Indies and England.

Both ranking schemes show West Indies was the best team between 1981 and 1990. Their best period was between February 1981 and December 1989: in 69 Tests in that span, they had a 40-7 win-loss record, with victories against Australia, England, New Zealand and India. During the same span, Pakistan was victorious against quality opposition like Australia, England, and India. We observe that both ranking schemes predict Australia as the best team since then. The dominance of Australia in both decades is also reflected in the fact that between October 1999 and November 2007, they played 93 Tests, and won 72 of them with 72-10 win-loss record. The ranking of other teams according to PageRank does not correspond to those of ICC Ranking. During 1991 − 2000 India occupies the third position according to PageRank score, instead of West Indies. Similarly, between 2001 and 2010, India occupies the second position according to PageRank, whereas according to the ICC Ranking South Africa occupies the second spot.

We report a similar ranking of teams in ODI cricket in different era in Table 7. We observe that West Indies was the best team throughout the 70’s and 80’s. PageRank score shows that South Africa was the best team in the 90’s and Australia is the best team from 2000 − 2010. According to ICC Ranking Australia is the most successful team during the 1990s and also from 2000 − 2010. We observe strong correlation between PageRank score and Reliance ICC Ranking and fraction of victories (in-strength rank). We compare the overall ranking of teams playing Test cricket (1952 − 2010) and ODI cricket (1981 − 2010). Figure 4(a) shows that between 1952 and 2010 South Africa is the best team according to PageRank score, where as Australia is the best team according to Reliance ICC Ranking. We observe strong correlation between the ranking schemes for ODI cricket (1981 − 2010) (as shown in Figure 4(b)). According to PageRank score and in-strength the top three positions in Test cricket (1877 − 2010), are occupied by Australia, South Africa and England respectively (see Figure 4(c)). In ODI cricket (1971 − 2010), Australia emerges as the best team according to PageRank score as well as in-strength. In Figure 5 we show the correlation among different ranking schemes as function of time.

We provide a ranking of captains in Test cricket (Table 8) and ODI cricket (Table 9) in different era. Between 1877 and 1951 Bill Woodfull (Australia) is the most successful captain with Sir Don Bradman occupying the second position. Richie Benaud (Australia) leads the list twice during 1952 − 1960 and 1961 − 1970. During the period 1971 − 1980 Ian Chappell occupies the top position as captain, with
Table 1. Most successful teams in history of Test cricket (1877 − 2010). The teams are ranked according to the PageRank score of each team.

| Rank | Team           |
|------|----------------|
| 1    | Australia      |
| 2    | South Africa   |
| 3    | England        |
| 4    | West Indies    |
| 5    | Pakistan       |
| 6    | India          |
| 7    | Sri Lanka      |
| 8    | New Zealand    |
| 9    | Zimbabwe       |
| 10   | Bangladesh     |

Clive Lloyd occupying the second position. From 1981 − 1990 West Indies was the most successful team and Sir Vivian Richards was the most successful captain. Mark Taylor (Australia) is the best captain between 1991 and 2000 and Graeme Smith (South Africa) emerge as the best captain during 2001 − 2010. In ODI cricket Australia’s Greg Chappell emerge as the most successful captain between 1971 and 1980. Clive Lloyd occupy the second position during that period. Pakistan’s Imran Khan leads the list during the 1981 − 1990 era. South Africa’s Hansie Cronje was the most successful captain from 1991 − 2000. During the period 2000 − 2010 Ricky Ponting is the most successful captain followed by South Africa’s Graeme Smith and India’s M.S.Dhoni. In Figure 6 we show the correlation among the two ranking schemes for captains.

4 Conclusion

Our work demonstrates the strength of social network analysis methods in quantifying the success of cricket teams and their captains. Here we have created a directed and weighted network of contacts (i.e, teams and captains). The correct assessment of a team’s success (or captain’s success) needs the consideration of the entire network of interaction. The PageRank algorithm takes into account the quality of matches won. For example, a win against a strong team is more important than a win against a weak team. Also a captain is as good as the team. In this sense, a win against Clive Lloyd, Steve Waugh or Graeme Smith is more relevant than a win against a lesser captain. Our analysis shows that PageRank algorithm is effective in finding the most successful team and captain in the history of cricket.
Table 2. Most successful teams in the history of ODI cricket (1971 – 2010). The teams are ranked according to the PageRank score of each team.

| Rank | Team          |
|------|---------------|
| 1    | Australia     |
| 2    | South Africa  |
| 3    | West Indies   |
| 4    | England       |
| 5    | Pakistan      |
| 6    | India         |
| 7    | New Zealand   |
| 8    | Sri Lanka     |
| 9    | Zimbabwe      |
| 10   | Bangladesh    |

Table 3. Top twenty captains in Test cricket (1877 – 2010). We also provide the nationality of the captain. The captains are ranked according to the PageRank score of each captain.

| Rank | Captain             | Country      |
|------|---------------------|--------------|
| 1    | Steve Waugh         | Australia    |
| 2    | Graeme Smith        | South Africa |
| 3    | Ricky Ponting       | Australia    |
| 4    | Greg Chappel        | Australia    |
| 5    | Richie Benaud       | Australia    |
| 6    | Clive Lloyd         | West Indies  |
| 7    | Ian Chappel         | Australia    |
| 8    | Allan Border        | Australia    |
| 9    | M. S. Dhoni         | India        |
| 10   | Nasser Hussain      | England      |
| 11   | Peter May           | England      |
| 12   | Bill Woodfull       | Australia    |
| 13   | Sir Vivian Richards | West Indies  |
| 14   | Sir Frank Worell    | West Indies  |
| 15   | Sourav Ganguly      | India        |
| 16   | Kim Hughes          | Australia    |
| 17   | Ray Illingworth     | England      |
| 18   | Geoff Howarth       | New Zealand  |
| 19   | Andrew Strauss      | England      |
| 20   | Stephen Fleming     | New Zealand  |
Table 4. Top twenty captains in ODI cricket (1971 – 2010). We also provide the nationality of the captain. The captains are ranked according to the PageRank score of each captain.

| Rank | Captain              | Country        |
|------|----------------------|----------------|
| 1    | Ricky Ponting        | Australia      |
| 2    | Graeme Smith         | South Africa   |
| 3    | Imran Khan           | Pakistan       |
| 4    | Hansie Cronje        | South Africa   |
| 5    | Arjuna Ranatunga     | Sri Lanka      |
| 6    | Stephen Fleming      | New Zealand    |
| 7    | Clive Lloyd          | West Indies    |
| 8    | M. S. Dhoni          | India          |
| 9    | Sir Vivian Richards  | West Indies    |
| 10   | Kapil Dev            | India          |
| 11   | Allan Border         | Australia      |
| 12   | Mahela Jayawardene   | Sri Lanka      |
| 13   | Brian Lara           | West Indies    |
| 14   | Daniel Vettori       | New Zealand    |
| 15   | Paul Collingwood     | England        |
| 16   | Sourav Ganguly       | India          |
| 17   | Mohammad Azharuddin  | India          |
| 18   | Rahul Dravid         | India          |
| 19   | Javed Miandad        | Pakistan       |
| 20   | Wasim Akram          | Pakistan       |
Table 5. Ranking of teams in different era in Test history. We have shown the ranking from 1877 – 1980. There exist no ICC ranking during 1877 – 1950.

| Era       | PageRank          | Reliance ICC-Ranking |
|-----------|-------------------|----------------------|
| 1877-1950 | Australia, England, West Indies, South Africa, New Zealand, India | -NA- |
| 1951-1960 | Australia, England, Pakistan, West Indies, South Africa, India, New Zealand | Australia, England, West Indies, South Africa, Pakistan, India, New Zealand |
| 1961-1970 | England, West Indies, Australia, New Zealand, South Africa, India, Pakistan | West Indies, Australia, England, South Africa, India, Pakistan, New Zealand |
| 1971-1980 | Australia, India, West Indies, England, Pakistan, New Zealand | Australia, England, Pakistan, India, New Zealand |
Table 6. Ranking of teams in different era in Test history. We have shown the ranking from 1981 – 2010.

| Era       | PageRank     | Reliance ICC-Ranking |
|-----------|--------------|----------------------|
| 1981-1990 | West Indies  | West Indies          |
|           | Pakistan     | Pakistan             |
|           | Australia    | New Zealand          |
|           | New Zealand  | Australia            |
|           | England      | India                |
|           | India        | England              |
|           | Sri Lanka    | Sri Lanka            |
|           | Zimbabwe     | Zimbabwe             |
| 1991-2000 | Australia    | Australia            |
|           | South Africa | South Africa         |
|           | India        | West Indies          |
|           | West Indies  | Pakistan             |
|           | Pakistan     | India                |
|           | England      | England              |
|           | New Zealand  | Sri Lanka            |
|           | Sri Lanka    | New Zealand          |
|           | Zimbabwe     | Zimbabwe             |
|           | Bangladesh   | Bangladesh           |
| 2001-2010 | Australia    | Australia            |
|           | India        | South Africa         |
|           | South Africa | India                |
|           | England      | England              |
|           | Sri Lanka    | Sri Lanka            |
|           | Pakistan     | Pakistan             |
|           | New Zealand  | New Zealand          |
|           | West Indies  | West Indies          |
|           | Zimbabwe     | Zimbabwe             |
|           | Bangladesh   | Bangladesh           |
Table 7. Ranking of teams in different era in ODI history. We construct network of teams for each era. The teams are then ranked according to the PageRank score and compared with the Reliance ICC Ranking of Teams. During the period 1981 – 1990 Zimbabwe and Bangladesh receive no points in the Reliance ICC Ranking and hence their ranks are not listed.

| Era     | PageRank   | Reliance ICC-Ranking |
|---------|------------|-----------------------|
| 1971-1980 | West Indies | West Indies          |
|         | Australia  | Australia             |
|         | England    | England               |
|         | Pakistan   | Pakistan              |
|         | India      | India                 |
|         | New Zealand| New Zealand           |
|         | Sri Lanka  | Sri Lanka             |
|         | Zimbabwe   | —                     |
|         | Bangladesh | —                     |
| 1981-1990 | West Indies | Australia             |
|         | Australia  | England               |
|         | England    | Pakistan              |
|         | Pakistan   | India                 |
|         | India      | New Zealand           |
|         | Sri Lanka  | Sri Lanka             |
|         | Zimbabwe   | —                     |
|         | Bangladesh | —                     |
| 1991-2000 | South Africa | Australia            |
|         | Australia  | South Africa          |
|         | Pakistan   | Pakistan              |
|         | England    | West Indies           |
|         | Sri Lanka  | England               |
|         | West Indies| India                 |
|         | India      | Sri Lanka             |
|         | New Zealand| New Zealand           |
|         | Zimbabwe   | Zimbabwe              |
|         | Bangladesh | Bangladesh            |
| 2001-2010 | Australia  | Australia             |
|         | South Africa| South Africa          |
|         | India      | Sri Lanka             |
|         | Sri Lanka  | Pakistan              |
|         | Pakistan   | India                 |
|         | New Zealand| New Zealand           |
|         | England    | England               |
|         | West Indies| West Indies           |
|         | Bangladesh | Zimbabwe              |
|         | Zimbabwe   | Bangladesh            |
Table 8. Ranking of captains in different era in Test history. We have shown the ranking of top five captains between 1877 – 2010 as well as their nationality. A network of competing captains are generated for each era. We run the ranking procedure and rank the captains according to their PageRank score.

| Era       | Top five captains            | Country          |
|-----------|------------------------------|------------------|
| 1877-1950 | Bill Woodfull                | Australia        |
|           | Sir Donald Bradman          | Australia        |
|           | John Goddard                | West Indies      |
|           | Sir Gubby Allen             | England          |
|           | Normal Yardley              | England          |
| 1951-1960 | Richie Benaud               | Australia        |
|           | Gulabrai Ramchand           | India            |
|           | Peter May                   | England          |
|           | Abdul Kardar                | Pakistan         |
|           | Lindsay Hassett             | Australia        |
| 1961-1970 | Richie Benaud               | Australia        |
|           | Sir Frank Worrell           | West Indies      |
|           | Bob Simpson                 | Australia        |
|           | Ted Dexter                  | England          |
|           | Sir Garry Sobers            | West Indies      |
| 1971-1980 | Ian Chappel                 | Australia        |
|           | Clive Lloyd                 | West Indies      |
|           | Greg Chappell               | Australia        |
|           | Ray Illingworth             | England          |
|           | Mike Denness                | England          |
| 1981-1990 | Sir Vivian Richards         | West Indies      |
|           | Allan Border                | Australia        |
|           | Greg Chappell               | Australia        |
|           | Clive Lloyd                 | West Indies      |
|           | Geoff Howarth               | New Zealand      |
| 1991-2000 | Mark Taylor                 | Australia        |
|           | Hansie Cronje               | South Africa     |
|           | Allan Border                | Australia        |
|           | Mike Atherton               | England          |
|           | Steve Waugh                 | Australia        |
| 2001-2010 | Graeme Smith                | South Africa     |
|           | Ricky Ponting               | Australia        |
|           | Steve Waugh                 | Australia        |
|           | M. S. Dhoni                 | India            |
|           | Sourav Ganguly              | India            |
Table 9. Ranking of captains in different era in ODI history. A network of teams is generated for each era. We then run the PageRank algorithm on each network which gives a PageRank score. The teams are then ranked according to their PageRank score. We have shown the ranking of top five captains between 1971 – 2010 as well as their nationality.

| Era       | Top five captains          | Country        |
|-----------|----------------------------|----------------|
| 1971-1980 | Greg Chappell              | Australia      |
|           | Clive Lloyd                | West Indies    |
|           | Geoff Howarth              | New Zealand    |
|           | Mike Brearley              | England        |
|           | Sunil Gavaskar             | India          |
| 1981-1990 | Imran Khan                 | Pakistan       |
|           | Sir Vivian Richards        | West Indies    |
|           | Kapil Dev                  | India          |
|           | Allan Border               | Australia      |
|           | Javed Miandad              | Pakistan       |
| 1991-2000 | Hansie Cronje              | South Africa   |
|           | Arjuna Ranatunga           | Sri Lanka      |
|           | Mohammad Azharuddin        | India          |
|           | Wasim Akram                | Pakistan       |
|           | Richie Richardson          | West Indies    |
| 2001-2010 | Ricky Ponting              | Australia      |
|           | Graeme Smith               | South Africa   |
|           | M. S. Dhoni                | India          |
|           | Stephen Fleming            | New Zealand    |
|           | Mahela Jayawardene         | Sri Lanka      |
It should be noted that success of a team or a captain depends on various factors like home advantage, success of batsmen and bowlers. For example, Australia’s dominance in both forms of the game is a manifestation of the fact that they are able to adjust in all kinds of pitches around the world, whereas subcontinent teams always played well under subcontinent conditions but were not able to repeat their performance abroad on a consistent basis. Our analysis does not require these ‘external’ factors which are usually taken into account in ICC rankings. However, we
Figure 5. Correlation among different ranking schemes. (A) Spearman correlation coefficient (red) and Kendall $\tau$ (blue), between the ranking based on PageRank and the one based on the Reliance ICC Ranking, as function of time, for Test matches (1952 – 2010). (B) The correlation coefficients are calculated between the ranking based on PageRank and the one Reliance ICC Ranking for ODI matches (1981 – 2010). (C) The correlation coefficients are calculated between the ranking based on PageRank and In-strength for Test matches (1952 – 2010). (D) The correlation coefficients are calculated between the ranking based on PageRank and In-strength for ODI matches (1981 – 2010).

would like to mention that our method does not aim to replace the ICC ranking. It suggests a novel approach to refine the existing ranking scheme.
We would like to state that cricket is a team game. Success or failure of a team depends on the collective performance of all team members. Simple statistics like runs scored by batsmen, wickets taken by bowlers or exceptional fielding does not provide a reliable measure of a player’s contribution to the team’s cause. Quantifying the impact of player’s individual performance in sports has been a topic of interest in soccer (Duch et al. (2010)) and baseball (Saavedra et al. (2009)). However, in
Figure 6. Relation between PageRank and in-strength Rank for captains. (A) Scatter plot between the rank positions obtained according to in-strength and those obtained with PageRank for Test cricket (1952−2010); (Kendall $\tau = 0.734$, Spearman correlation $\rho = 0.892$). (B) Scatter plot between the rank positions obtained according to in-strength and those obtained with PageRank for ODI cricket (1981−2010); ($\tau = 0.836$, $\rho = 0.948$).

In cricket the rules of the game are different and therefore it would be interesting to apply tools of network analysis on interaction between players. For example, a contact network of batsman vs. bowler could give an estimate of the greatest batsman (bowler) ever. Potentially, a quantitative approach to a player’s performance could be used to estimate the Man of the Match (Series) award after a tournament.
Acknowledgement

We thank the cricinfo website for the public availability of information on cricket matches. We also gratefully acknowledge helpful discussions with Rufaro Mukogo, David Mertens and Xiaohan Zeng.

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