

NEWS, INFORMATION, TOURNAMENTS, AND REPORTS

LONGCATMJ WINS MAHJONG TOURNAMENT IN TCGA 2011

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The first computer Mahjong tournament in the world was held as part of the TCGA 2011 computer game tournaments, which took place in Chang Jung Christian University, Tainan, Taiwan, from June 25th to 26th, 2011 (see Yen, Su, and Wu, 2011). Three teams participated in the Mahjong tournament. Table 1 lists the participants and the final standings. The three teams were LONGCATMJ, GRANDSLAM, and MAJO. They obtained 110,500; 59,000 and 11,500, respectively. Hence they won the gold, silver, and bronze medal in this order.

| Ranking | Program | Author(s) | Scores |
|---------|-----------|---|---------|
| 1 | LONGCATMJ | Cheng-Hung Lin, and I-Chen Wu | 110,500 |
| 2 | GRANDSLAM | Cheng-Wei Chou, and Shi-Jim Yen | 59,000 |
| 3 | MAJO | Kai-Min Chuang, Yueh-Ju Chen, and Shun-Shii Lin | 11,500 |

Table 1: The participants and final standings.

In general, the rules for Mahjong are quite complex. Besides, many different variations of Mahjong are using different rules in the world. This tournament used the version commonly played in Taiwan, which are described by Lin, Shan, and Wu (2011) in greater detail. The total tiles of Mahjong are 144 pieces, classified into six kinds of suits, which include *Wan* (ten thousand, or 萬 in Chinese), *Tiao* (rope, 條 or 索), *Tong* (dot, or 筒), *Wind* (風), *Dragon* (箭) and *Flower* (花). *Wan* includes 1-Wan to 9-Wan; and *Tiao* and *Tong* are similar. *Wind* includes East, West, South, and North Winds; and *Dragon* has Red, Green and White Dragons. Each of them has four tiles. Flowers are related to extra bonus and have nothing to do with win-loss. Players initially obtain 16 tiles from a pool, and then take turns to bid a new tile (the 17th) and discard a tile to exchange tiles after bidding a tile.

In Mahjong, players win the game by making a *winning pattern*, including five *sets* of tiles and a *pair* of tiles (17 tiles in total). A set of tiles is either three identical tiles, say three 2-Wans, or three consecutive tiles, say 2-Wan, 3-Wan, and 4-Wan. If a player A wins (or makes a winning pattern) by bidding a card discarded by another player B, it is said that A wins by *Hu* (胡) in Chinese. The player B is called *Chucker*. Only B loses points S_A (or scores) to A, where $S_A = V_{Base} + N_T * V_{Tai}$, where V_{Base} and V_{Tai} are constants designated before games, and N_T is the number of Tais, calculated based on Mahjong rules (see Lin, Shan, and Wu, 2011). If the player A wins by bidding one card from the pool, it is said that A wins by *Self-Mo* (自摸) in Chinese. All the other three players lose S_A points to A. In Mahjong, the final winner is the one who obtains the highest number of points (or scores). More rules and terminologies can be found in Lin, Shan, and Wu (2011).

Since the game is quite complex, this tournament leveraged the Mahjong network game system of a web game server, currently supported by ThinkNewIdea Ltd. The architecture of the tournament system is described in more detail in Lin, Shan, and Wu (2011). The following tournament rules are used (also for fairness without concerning uncertainty to a large extent).

1. The time limitation for each move of players is three seconds.
2. The values V_{Base} and V_{Tai} are 1000 and 500, respectively.
3. Since a Mahjong game needs four players, the tournament host used an additional program, named DUMMY. The DUMMY program never tried to win and always discarded the tile which it received.
4. 12 *Jongs* (將) are played. A Jong consists of four rounds. Each round has four games, in which each player serves as the dealer (or banker) once.
5. For each of the four games, the system uses the same random seed.

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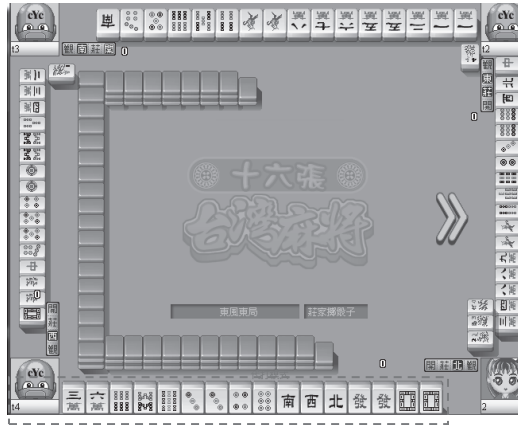


Figure 1: The initial tiles of the game in the third round of the 11th Jong.

The above rule 5 is important. For example, in the third round of 11th Jong, each dealer obtained the initial cards, as those indicated with dotted line in Figure 1(a). Since the game favoured the dealer, each of the players (except DUMMY) won the game when serving as the dealer. Using the same random seed would make the situation fairer.

| Program | Scores | Numbers of winning games | Number of Self-Mos |
|-----------|---------|--------------------------|--------------------|
| LONGCATMJ | 110500 | 61 | 16 |
| GRANDSLAM | 59000 | 34 | 15 |
| MAJO | 11500 | 40 | 14 |
| DUMMY | -181000 | 0 | 0 |

Table 2: The statistics of Hus, Self-Mos, and Chuckers in tournament

According to the rules of Mahjong, the winner is the one who obtains the highest scores, instead of the one who obtains the highest number of winning games. From Table 2, we observe that LONGCATMJ won both, i.e., score and number of winning games. However, GRANDSLAM won more scores than MAJO, while winning fewer games than MAJO. From our observation, GRANDSLAM won by Self-Mo with more Tais, implying more scores. This shows an issue: should the tournament be ranked by scores or by the numbers of winning games? The three teams all agreed to use scores before tournament, since we wanted to make the tournaments as close to the original Mahjong as possible, though the three participants did not incorporate the issue into their programs. This is to be discussed in the next tournament.



F.l.t.r. Cheng-Hung Lin (Gold), Cheng-Wei Chou (Silver) and Kai-Min Chuang (Bronze).

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