



2018 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS2018)

Overview

Hand fans are an accessory used among all cultures from East to West, from Ancient Egypt, China, Japan, and England to Spain, where they have been very popular since the XIV century and massively used up to today. Spanish fans are also an undisputed part of the Flamenco dance where the dancer may have to dance while using props such as a fan.

Its daily use is for refreshing by opening and producing a periodical motion. Its correct manipulation is not easy and needs to be taught in a special way. The fan needs to be maintained in the appropriate plane respect to face and then revolve around a pivot so that it can be opened or closed when in use or not in use.

This common object in Spanish culture has some serious challenges from the point of view of robotic perception and manipulation: recognition and localization, grasp planning, stable holding, opening and closing strategies, etc. The fan problem is open to many approaches, and the aim is to exploit the research community creativity, so imaginative solutions are expected. Figure 1 shows frames from a video illustrating the opening and closing of a typical Spanish fan.

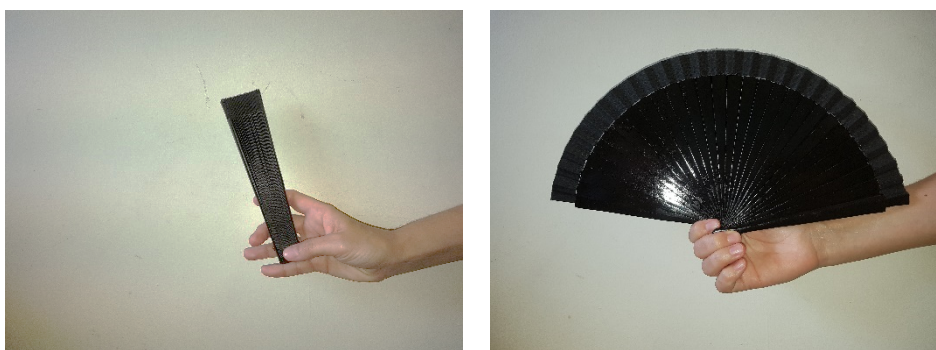


Figure 1. An example of manual grasping of a Spanish fan

IROS2018 fan Robotic Challenge

The objective of the challenge is to manipulate the Spanish fan as good and fast as possible. The whole procedure includes the following steps: 1) pick the closed fan from the table, 2) position the fan in a parallel plane to the wall, 3) open the fan, 4) close the fan, and 5) place it

on the table. Two main features are important and will score during this process: a) time and b) degree of opening and closing of the fan.

The Challenge will have different phases of increasing complexity:

- **Phase I Modality A** (October 2017 - March 2018): Video submission phase with the target of opening and closing the Spanish fan in front of a white wall or board in a parallel plane. The robot must perform this mission in an autonomous way, with no human intervention after the fan is given/taken to the robot (grasping is not included in this phase). Prize for winners: **Paper accepted in IROS (Special Session** for the winners).
- **Phase I Modality B** (October 2017 - March 2018): Video submission phase, but with the target of the whole process (described previously): grasp from a white table, position, open, close, ungrasp on the table. The novelty is the ability to localize and grab/drop the folding fan from/to a table, and then perform the Phase I Modality A autonomously. Prize for winners: **Paper accepted in IROS (Special Session** for the winners).
- **Phase II** (October 1-5, 2018): Physical phase during the IROS 2018 conference. This phase will be the reproduction of Phase I but in real conditions at the conference venue with a real robot. Participants can use their own robots or different robots (to be defined) provided by the organization and the sponsors. More information coming soon. Prize for winners: Monetary award and travel support, to be determined.

The following conditions need to be taken into account during the challenge:

- Any robotic arm can be used.
- Any robotic gripper or grasp device can be used; the only restriction for Phase I-B and Phase II is the autonomous pick and place abilities of the robot; no restrictions for Phase I-A.
- The robotic motion and grasping, as well as the robot perception, need to be performed in an autonomous way.
- Any perception system can be used.
- No additional devices can be used on the fan.
- The table and the wall must be pale white.
- The table must be perpendicular to the wall.
- Only the official Spanish fan provided by the IROS 2018 organization can be used. You can obtain it at major robotic conferences or contacting the organizers (fanchallenge@iros2018.org).
- The dimensions of the fan are: 16.3 cm x 3.4 cm x 1.3 cm when closed; the diameter of the semicircle (fan opened) is 29 cm. The weight is 25 g.

How to participate

You must send to the organizers your information that includes personal and institutional data – it will be treated according to confidentiality conditions.

- For **Phase I**, you need to send an email to the organizers (fanchallenge@iros2018.org) with your video or link to the video and password, if necessary. The subject of the email must be: ***IROS2018 fan Challenge, Phase I Modality (A or B), Name Institution.***
- For **Phase II**, you need to send an email to (fanchallenge@iros2018.org) with the following subject: ***IROS2018 fan Challenge, Phase II, Name Institution.***

The submitted video format and conditions are open, but need to be performed in a way to clearly perform the scoring described below. The wall and recording camera need to be parallel to each other and perpendicular, respectively, to the table. The video will also need to provide evidence of real time recording of the performance.

Scoring

The scoring is based on two metrics:

- Time of the execution in any phase, which will be normalized to the best one – 50% of score.
- Percentage of opening and closing of the fan, which will be normalized to the best ones – 25% (opening) and 25% (closing).

Awards

Three winners will be chosen in each modality of Phase I (Modalities A and B). A **Special Session** will be arranged for the winners, which will be part of the Conference Proceedings. Therefore, **the winners of Phase I will have a paper accepted in the IROS Conference**. This session will include the papers of the top three scored teams in each phase. The papers will need to follow the papers' submission rules of the conference.

Three winners will be chosen in Phase II. The winners of Phase II will receive a monetary prize defined by the sponsor of the Challenge. In addition, a monetary award will be given to the best team. It will be announced during 2017. All the participants will receive the IROS2018 fan Challenge participation diploma.

Important dates

Phase I – Modalities A and B	
Deadline for Phase I A and B submission (participants data and video)	March 31, 2018
Announcement of the scores and winners	April 30, 2018
Deadline for submission of winners' papers	June 29, 2018
Final paper submission deadline	July 29, 2018
Phase II	
Deadline for registration for Phase II	June 30th, 2018
Competition	October 1-5, 2018