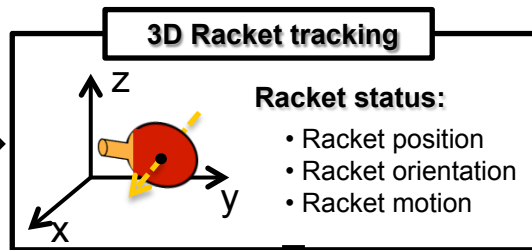


Research background



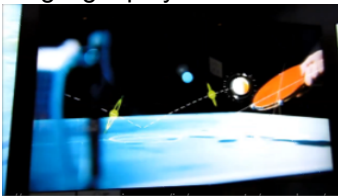
Target: accurate ping-pong racket tracking in 3D space for the position, orientation and motion

Problems in 3D ping-pong racket tracking

- Complex motions
- Lack of enough visible views
- Variation of racket colors and shapes
- Lack of features for racket motion

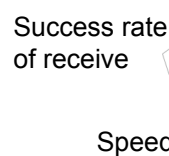
Applications in ping-pong

Highlight playback



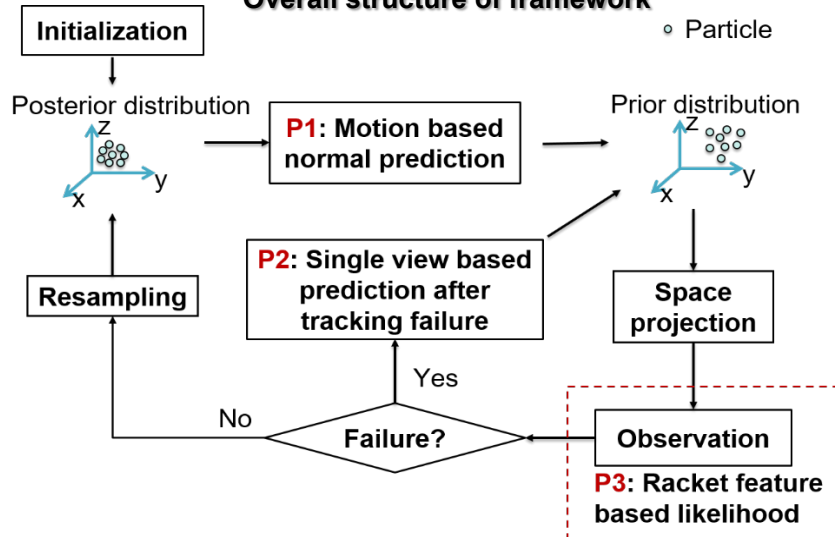
<http://www.panasonic.com/jp/corporate/wonders/wondersolutions/kaiseki.html>

Player evaluation



Proposals

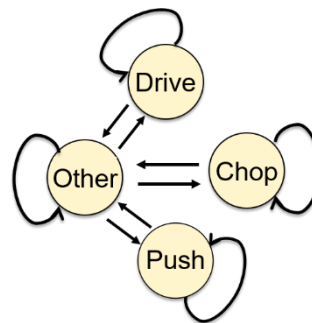
Overall structure of framework



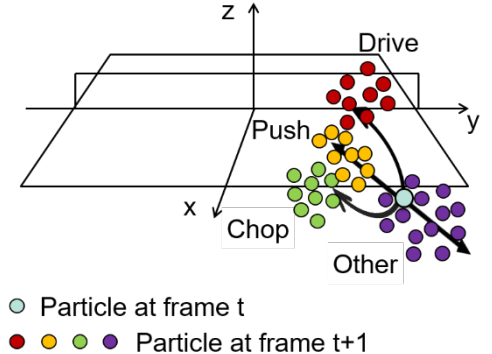
Motion based normal prediction

State vector = { racket motion, position, orientation, velocity }

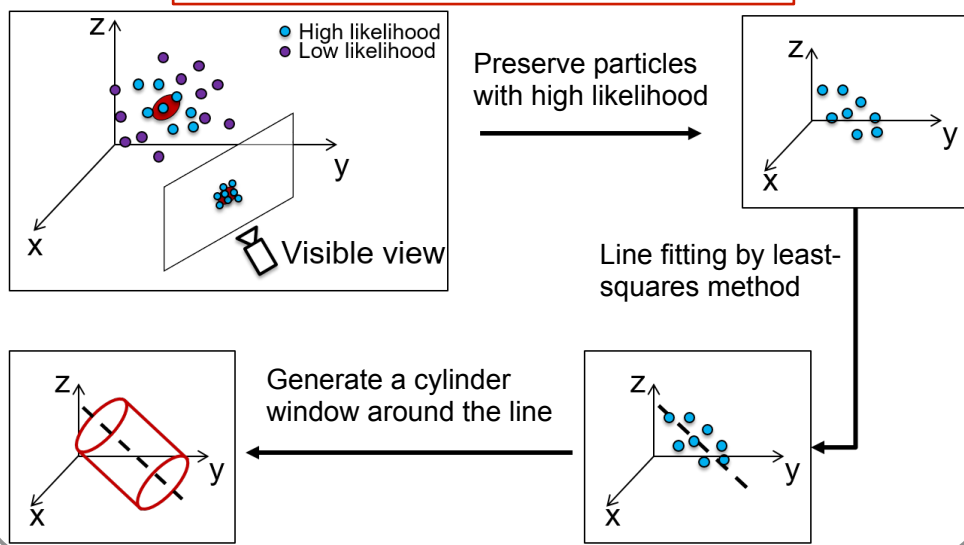
① Motion transition



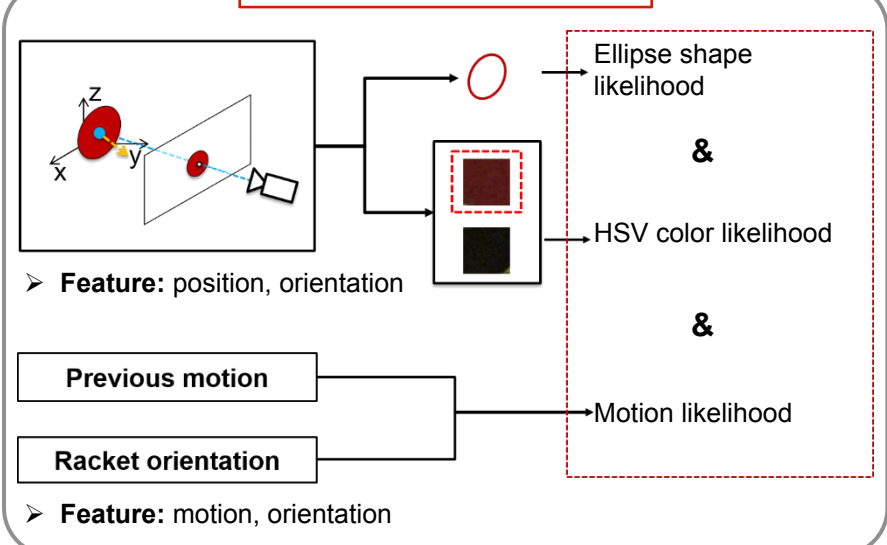
② Other states transition



Single view based prediction after tracking failure



Racket feature based likelihood



Experiment result

Table1. Evaluation for success rate of position and orientation

	P3	P1+P3	P1+P2+P3
Success frame number	3007	3216	4330
Success rate	66.78%	71.42%	96.16%

Table2. Evaluation for success rate of motion

	P1+P2+P3
Success frame number	4205
Success rate	93.38%

Conclusion

After applying our proposals, the success rate of position and orientation tracking achieves 96.16% and the success rate of motion tracking achieves 93.38%.

