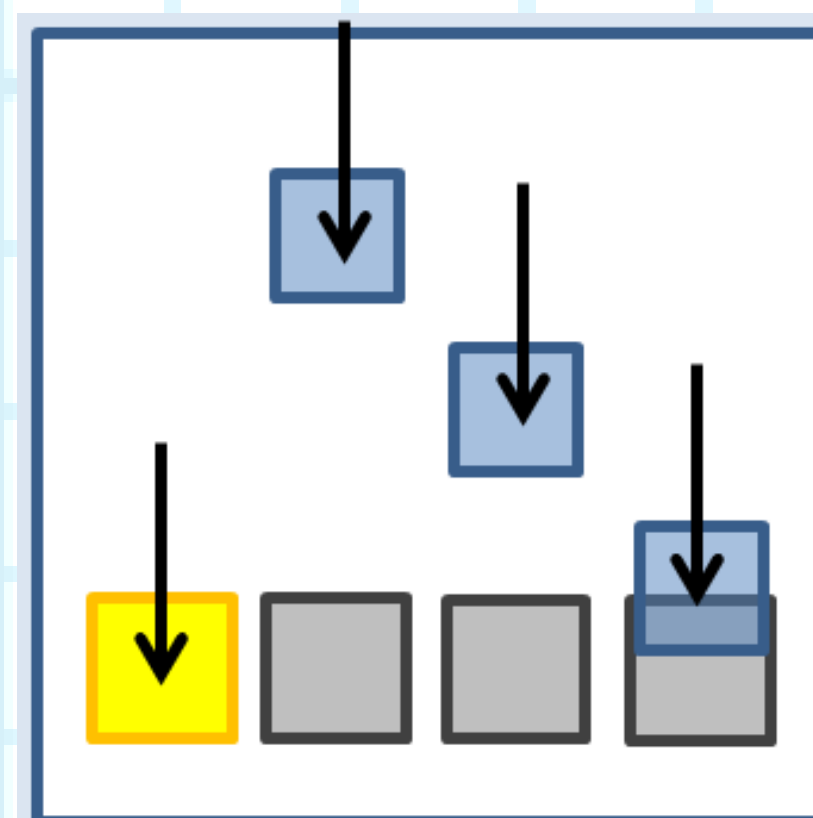




Designing Rhythm Game Interfaces for Touchscreen Devices

Philip Peng, Faculty Advisor: Stephen H. Lane
<http://beatsportable.com>

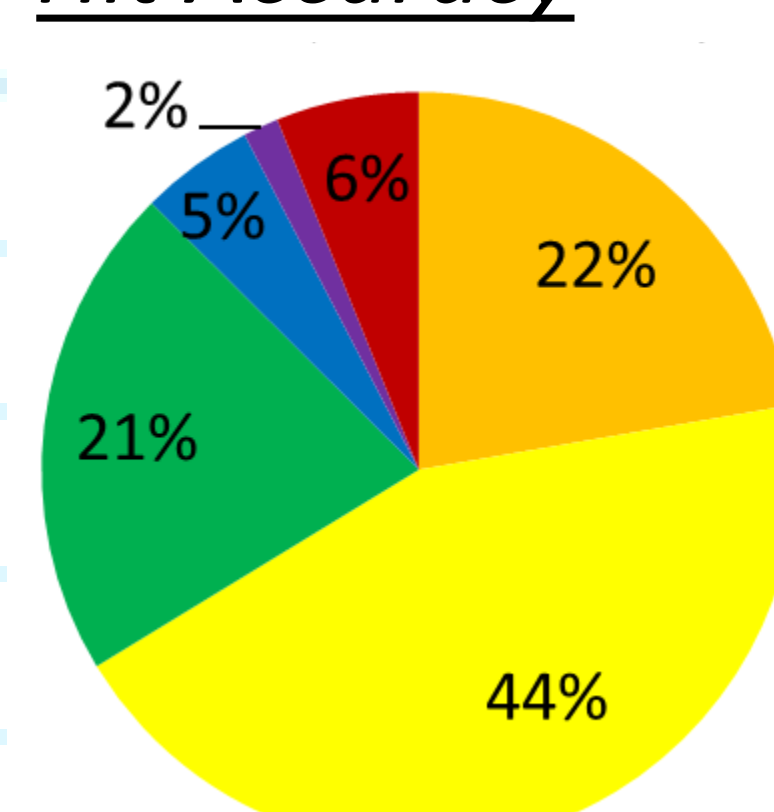
Design 1: Fall



Feedback:

Category	Ratings	Avg
Challenge	★★★★★	3.69
Intuitive	★★★★★	4.18
Fun	★★★★★	3.76
Unique	★★★★	2.43
Overall	★★★★	2.33

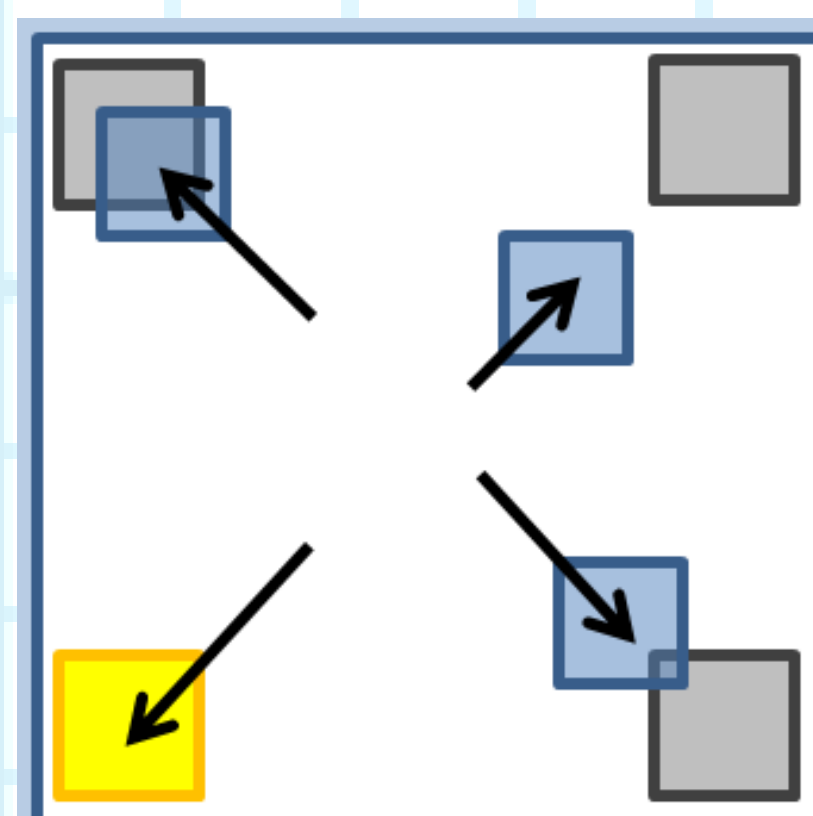
Hit Accuracy



Moving notes fall toward fixed hitboxes from top to bottom

Rhythm Games: *Dance Dance Revolution, Guitar Hero, Beatmania IIDX*

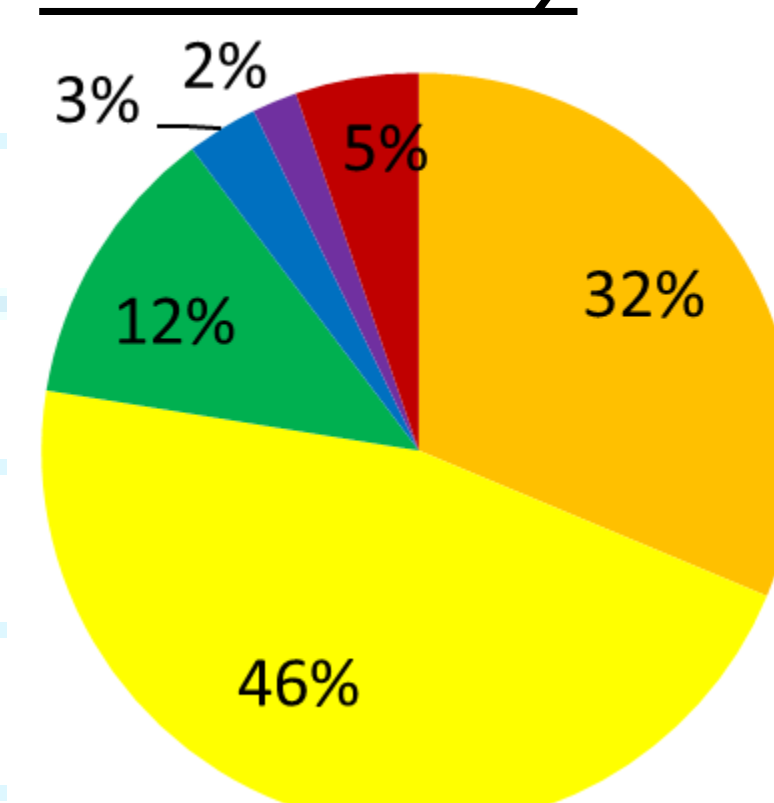
Design 2: Spread



Feedback:

Category	Ratings	Avg
Challenge	★★★★★	3.84
Intuitive	★★★★★	3.94
Fun	★★★★★	3.75
Unique	★★★★★	3.97
Overall	★★★★★	4.00

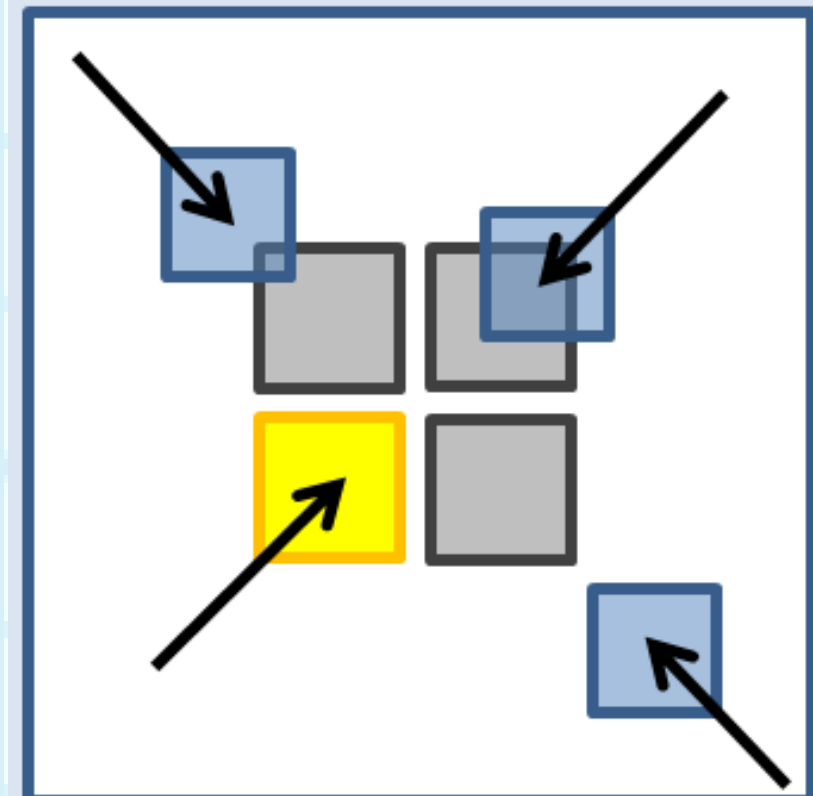
Hit Accuracy



Moving notes slide toward fixed hitboxes from centre to corners

Rhythm Games: *none*

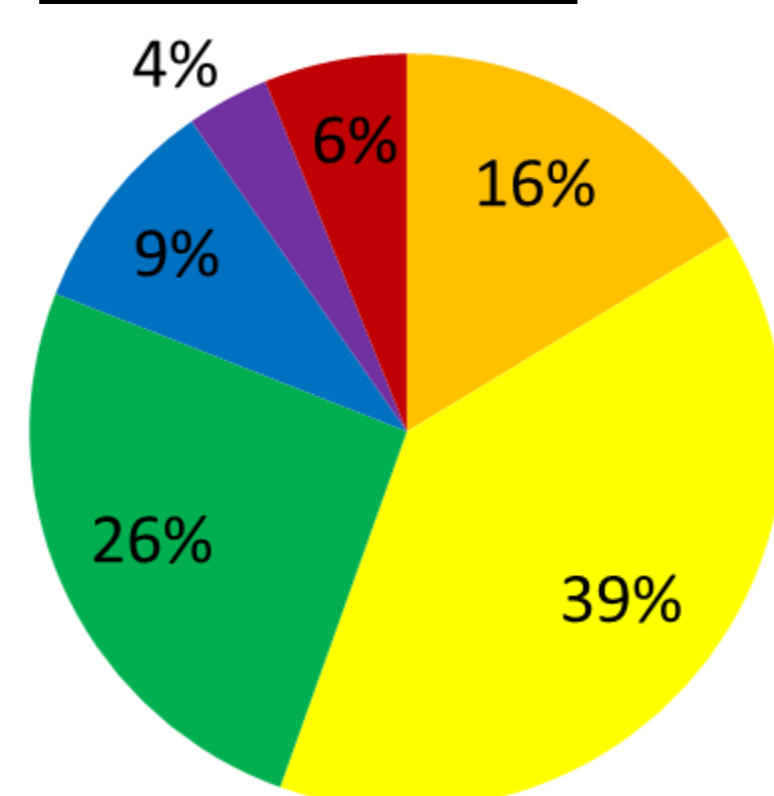
Design 3: Focus



Feedback:

Category	Ratings	Avg
Challenge	★★★★★	3.79
Intuitive	★★★★★	3.76
Fun	★★★★★	3.42
Unique	★★★★★	3.79
Overall	★★★★★	3.54

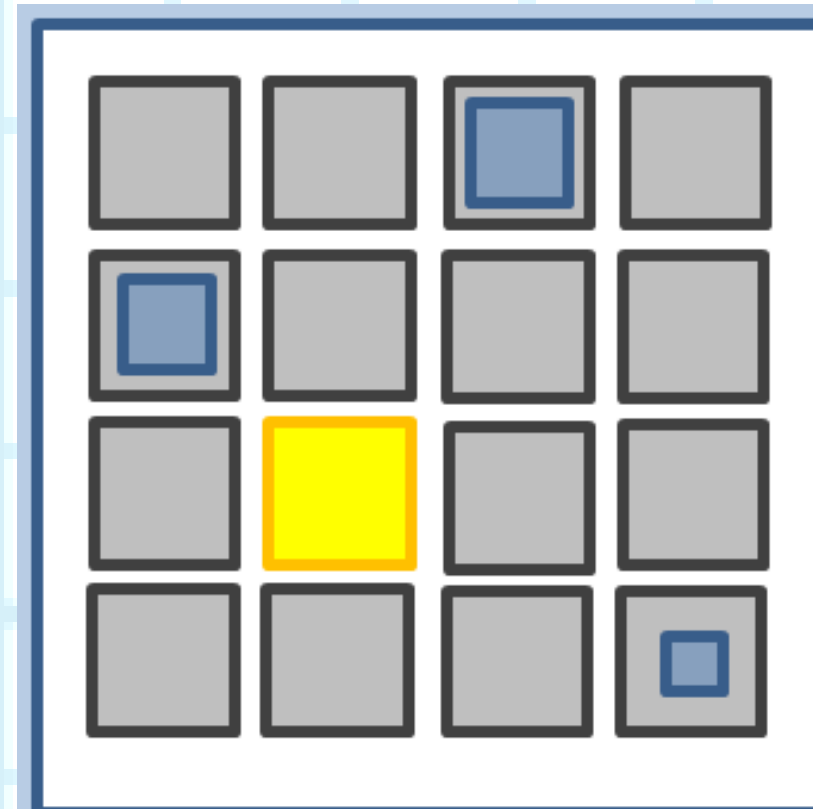
Hit Accuracy



Moving notes slide toward fixed hitboxes from corners to centre

Rhythm Games: *Gitaroo Man Lives!, Hatsune Miku: Project DIVA*

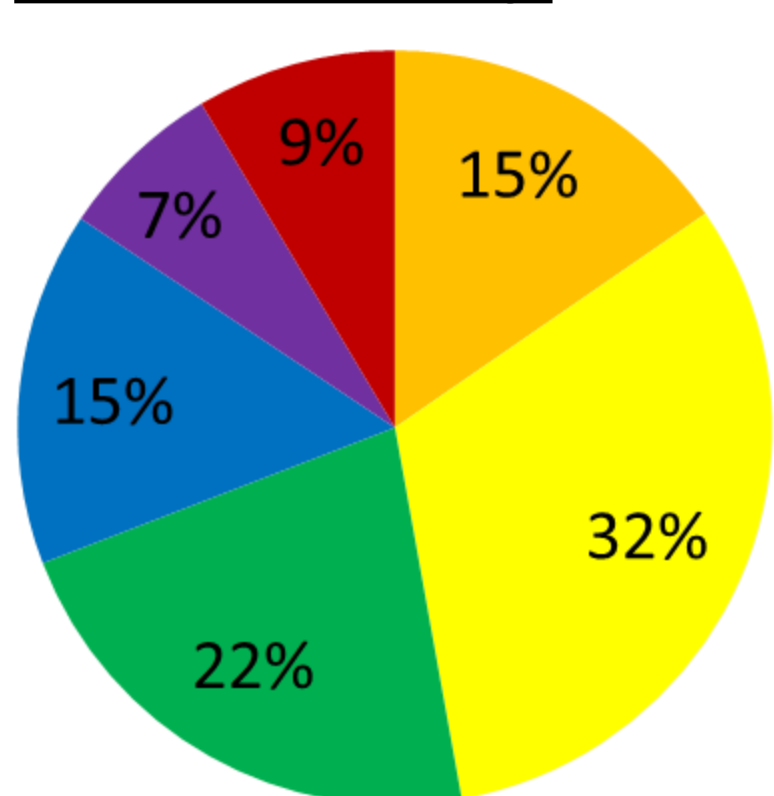
Design 4: Grid



Feedback:

Category	Ratings	Avg
Challenge	★★★★★	4.27
Intuitive	★★★★★	3.81
Fun	★★★★★	4.14
Unique	★★★★★	3.85
Overall	★★★★★	3.98

Hit Accuracy



Expanding notes grow in fixed hitboxes at grid points

Rhythm Games: *jubeats*

Abstract:

This project focuses on comparing different user interface designs for rhythm games on touchscreen devices. This is accomplished through the development of prototype rhythm games and analyzing collecting gameplay data.

Implementation:

"Beats2 Prototypes", a rhythm game designed for Android tablets, was published on Google Play. This poster presents the eight interface designs prototyped in the app and their respective data collection summaries.

Hit Accuracy:

During gameplay, note hits are assigned hit accuracy values based on the difference between expected and actual note hit times. The distribution of these values reflect on how the user interface affects the user's timing accuracy.

A high percent of "MARVELOUS" and "PERFECT" values means that the interface allows for accurate visual recognition (note timing window) and fast user reactivity (note tapping action).

Feedback:

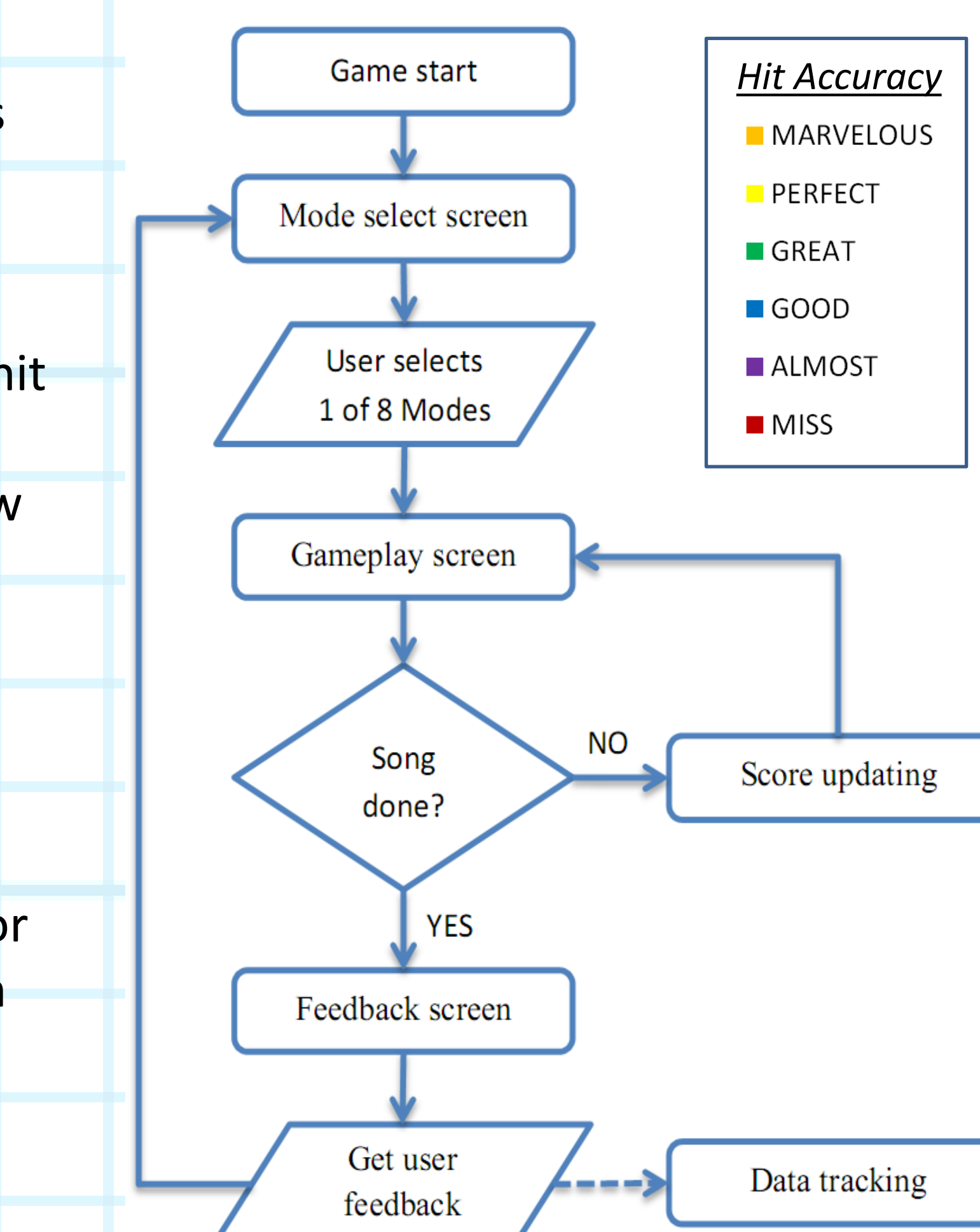
At the end of a song, the user is prompt to give qualitative feedback ratings on the gameplay experience. These 1-5 star ratings reflect on various aspects of game experience.

- **Challenge:** Difficulty of gameplay. More difficult = higher skill ceiling.
- **Intuitive:** Usage learning curve. More intuitive = higher reactivity.
- **Fun:** Game enjoyability. More fun = more returning users.
- **Unique:** Novelty of design. More unique = more first time users.
- **Overall:** General evaluation of gameplay experience.

Conclusion:

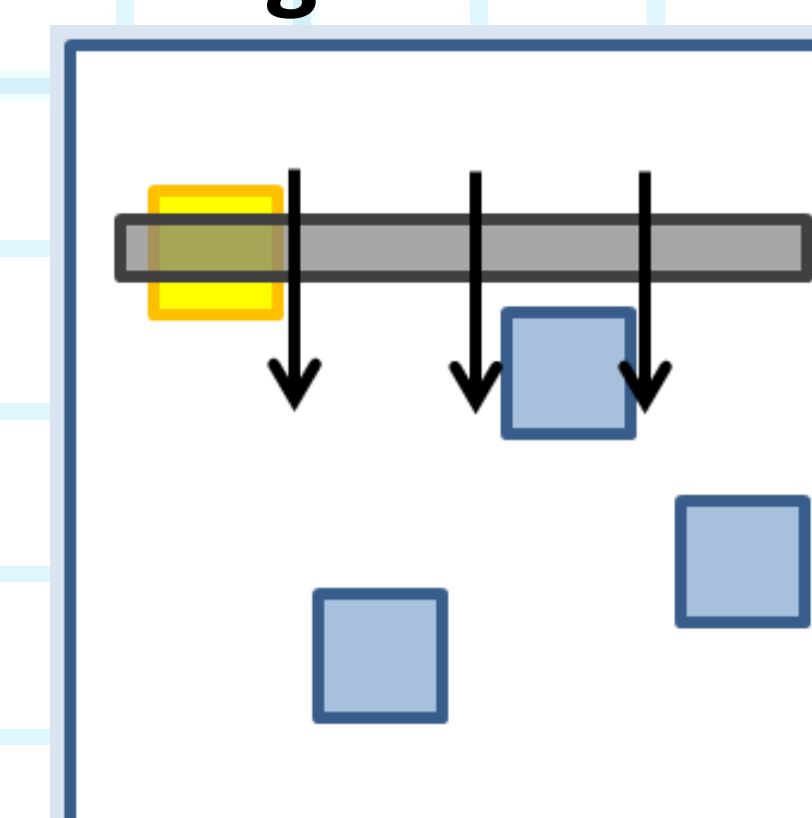
Based on these results, each interface design was ranked relative to each other in terms of timing accuracy and game enjoyability.

Of the eight designs studied, Design #2 is the best candidate for usage in future rhythm game development.



Mode	Timing Accuracy	Game Experience
#1: Falling Notes	Great	Poor
#2: Spreading Notes	Great	Great
#3: Focusing Notes	Good	Poor
#4: Grid	Poor	Great
#5: Sliding Hitbox	Good	Good
#6: Expanding Hitbox	Bad	Bad
#7: Collapsing Hitbox	Bad	Bad
#8: Appearing	Poor	Great

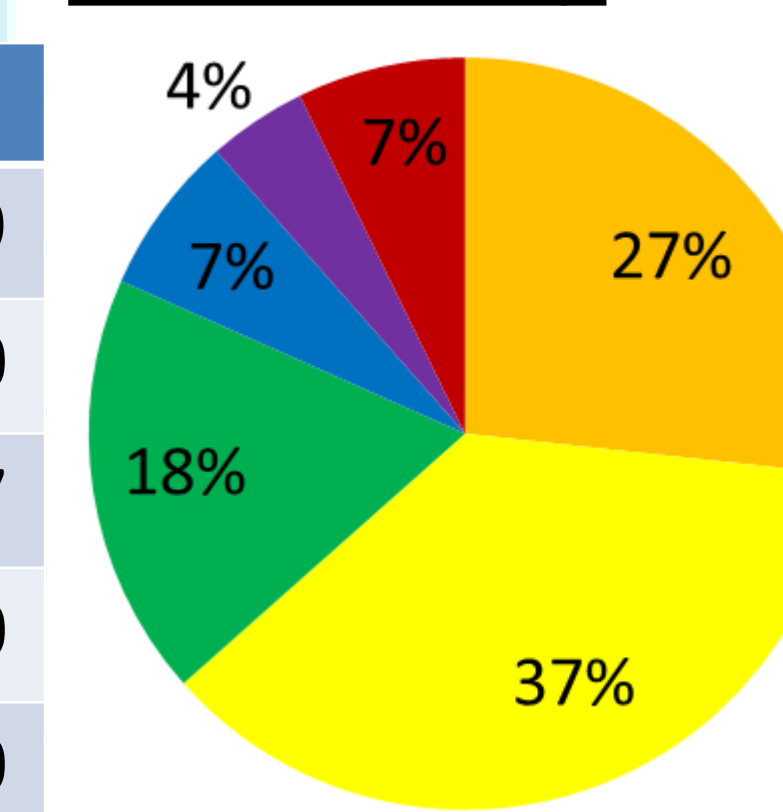
Design 5: Slide



Feedback:

Category	Ratings	Avg
Challenge	★★★★★	4.39
Intuitive	★★★★★	3.50
Fun	★★★★★	4.07
Unique	★★★★★	4.10
Overall	★★★★★	3.80

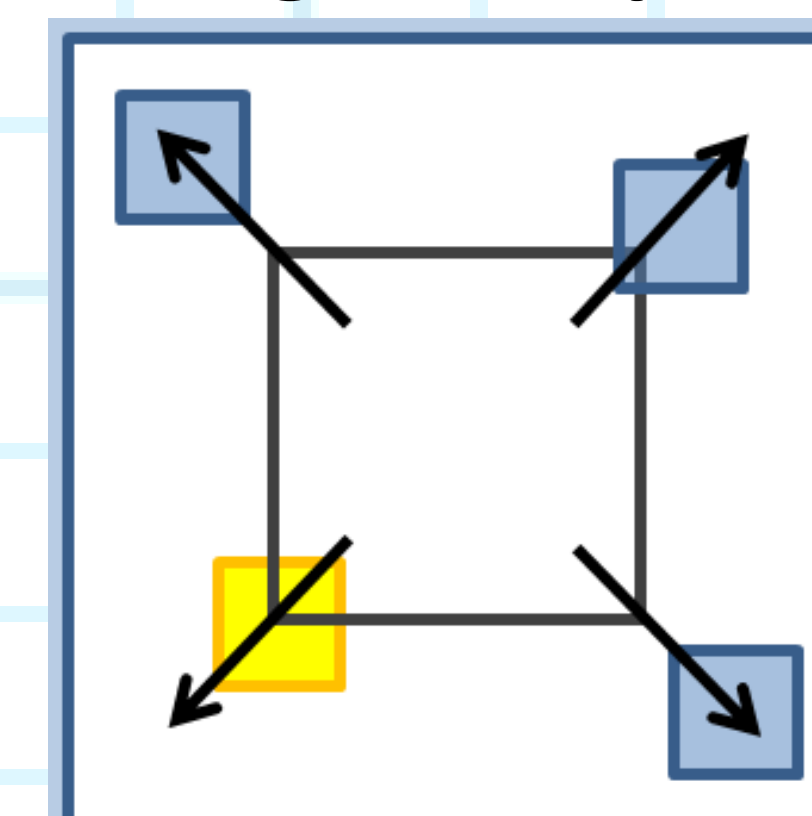
Hit Accuracy



Moving hitbox fall toward fixed notes appearing from top to bottom

Rhythm Games: *DJMax Technika*

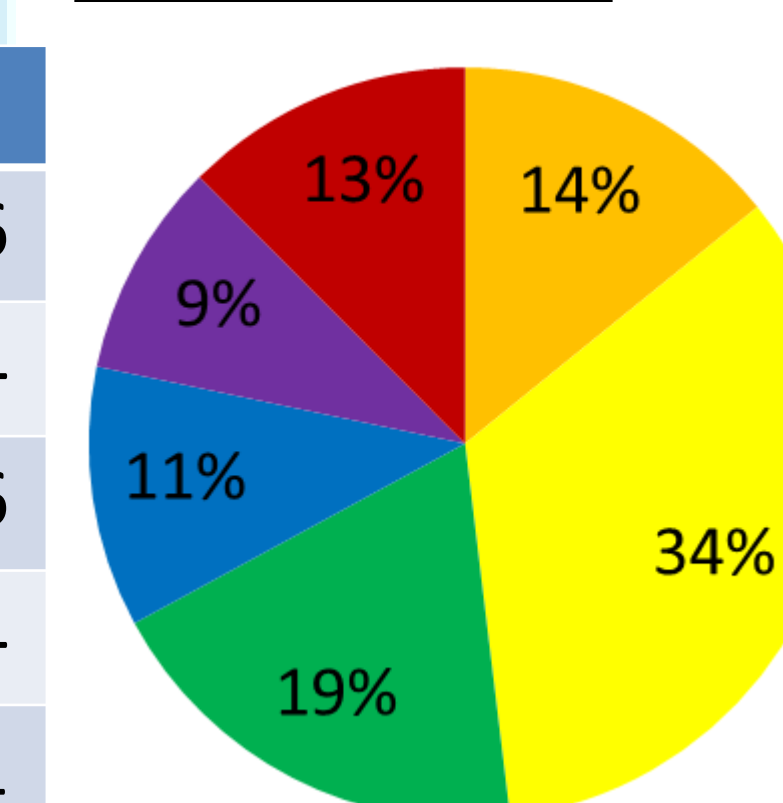
Design 6: Expand



Feedback:

Category	Ratings	Avg
Challenge	★★★★★	4.56
Intuitive	★★★★	2.84
Fun	★★★★★	3.36
Unique	★★★★★	4.54
Overall	★★★★★	3.41

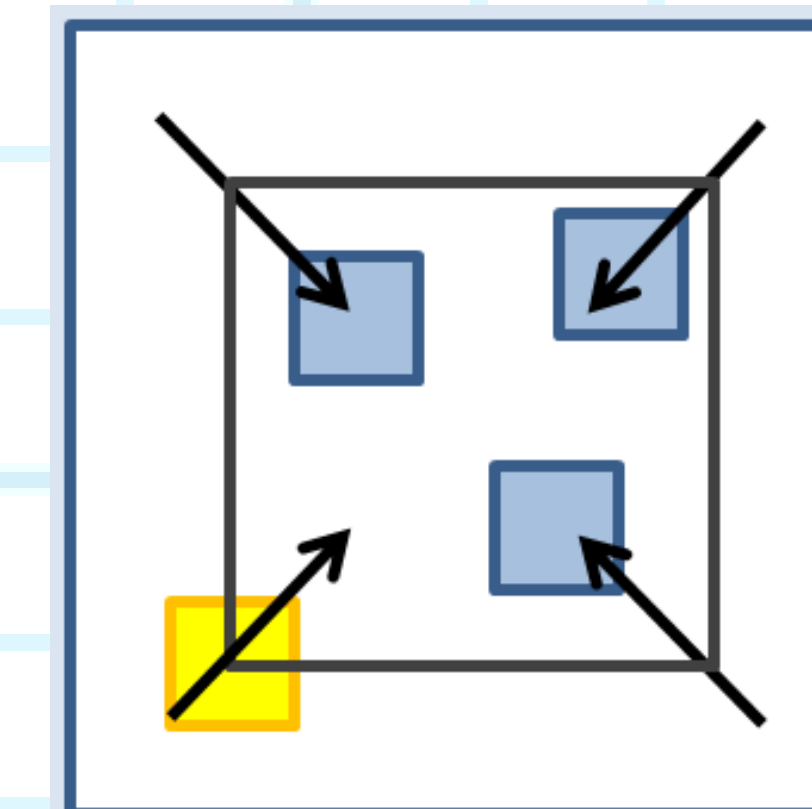
Hit Accuracy



Expanding hitbox grows toward fixed notes from centre to corners

Rhythm Games: *none*

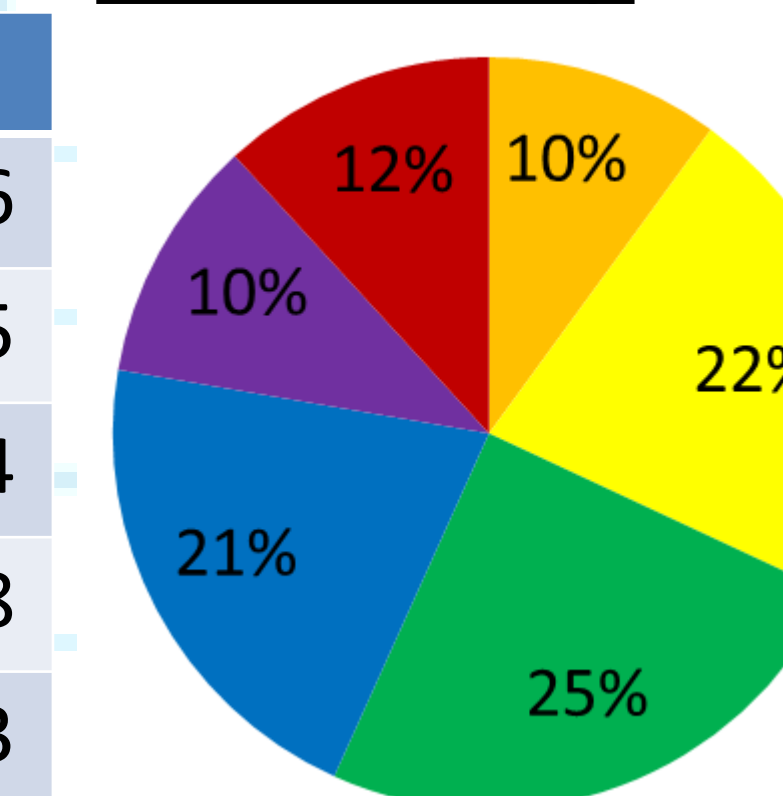
Design 7: Collapse



Feedback:

Category	Ratings	Avg
Challenge	★★★★★	4.26
Intuitive	★★★★	2.65
Fun	★★★★★	3.04
Unique	★★★★★	4.18
Overall	★★★★★	3.23

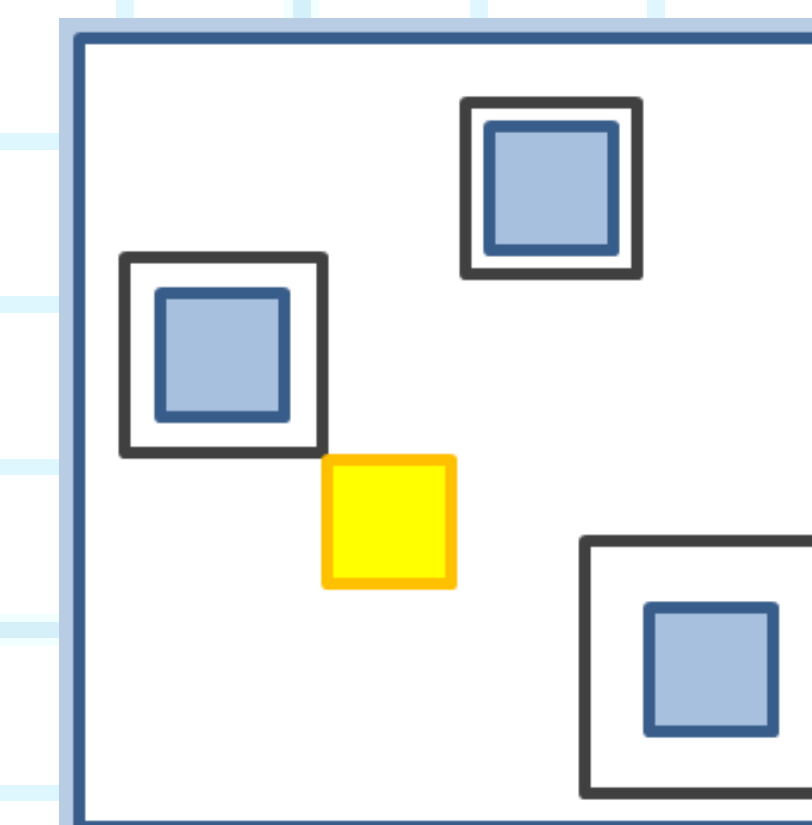
Hit Accuracy



Collapsing hitbox shrink toward fixed notes from corners to centre

Rhythm Games: *none*

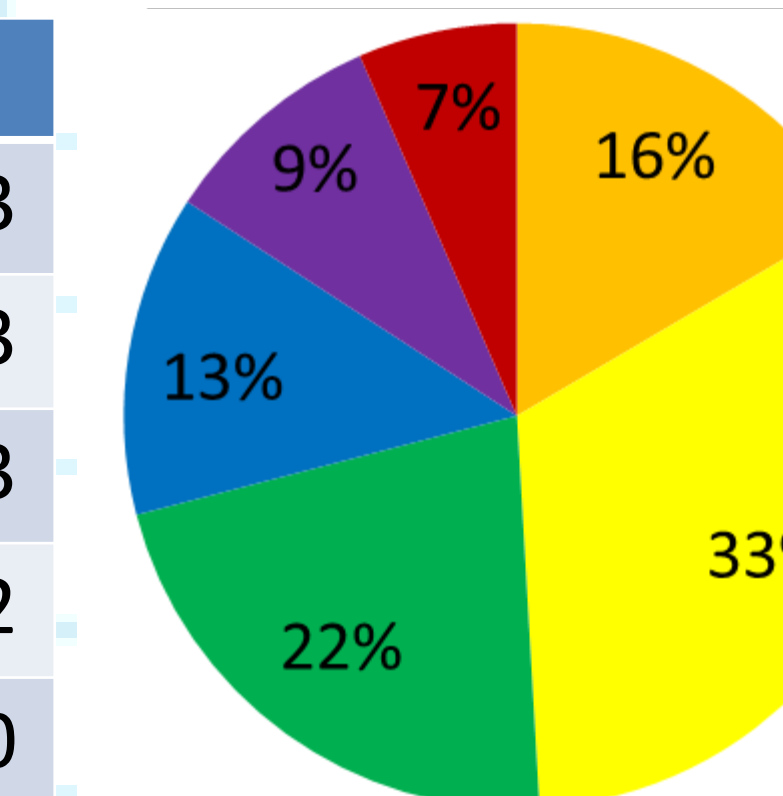
Design 8: Appears



Feedback:

Category	Ratings	Avg
Challenge	★★★★★	3.93
Intuitive	★★★★★	4.13
Fun	★★★★★	4.33
Unique	★★★★★	4.02
Overall	★★★★★	4.20

Hit Accuracy



Collapsing hitboxes shrink around fixed notes appearing at grid points

Rhythm Games: *osu! Tatakae! Ouendan!*

