Visualization of the Impact of Disc Golf Design Elements

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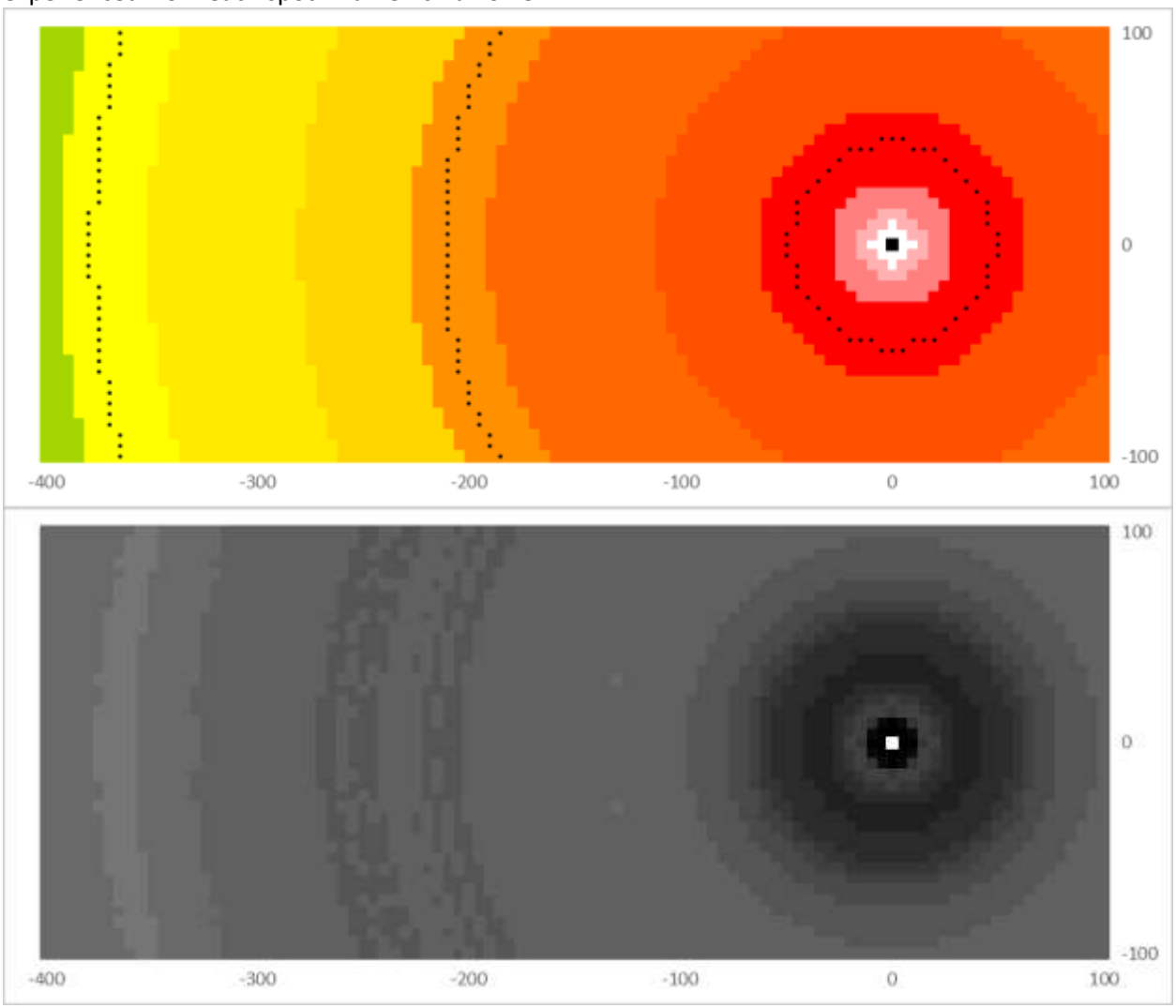
The way I see a hole, every spot has a certain expected scoring distribution. If a player's disc is lying next to the basket, they have a very high probability of taking one more throw to finish. If it is out at the edge of their maximum range, they'll get some combination of 2, 3, and 4.

The charts on this page show a wide open, flat hole. The expected scores are shown in colors with the expected score getting larger in concentric circles out from the target. The dotted lines are where average score is an integer. Orange=3.

The target is shown with a high contrast pixel in all the charts. Where's the tee pad? Anywhere. This shows what happens from all possible tee pad locations.

The black and white chart shows the scoring spread width, or how many different scores are experienced from each spot. Darker is narrower.



The charts on the next page show a double mando. The average scores are increased for all the lies behind the mando. The scoring spread width also increases significantly for many areas behind the mando (lighter grays).

Note the the players on the top half of the chart are aiming at the middle of the double mando. The players on the bottom half of the chart are just aiming straight at the target from anywhere.

The places where the scoring spread width increases the most (compared to a hole with no mandos) are

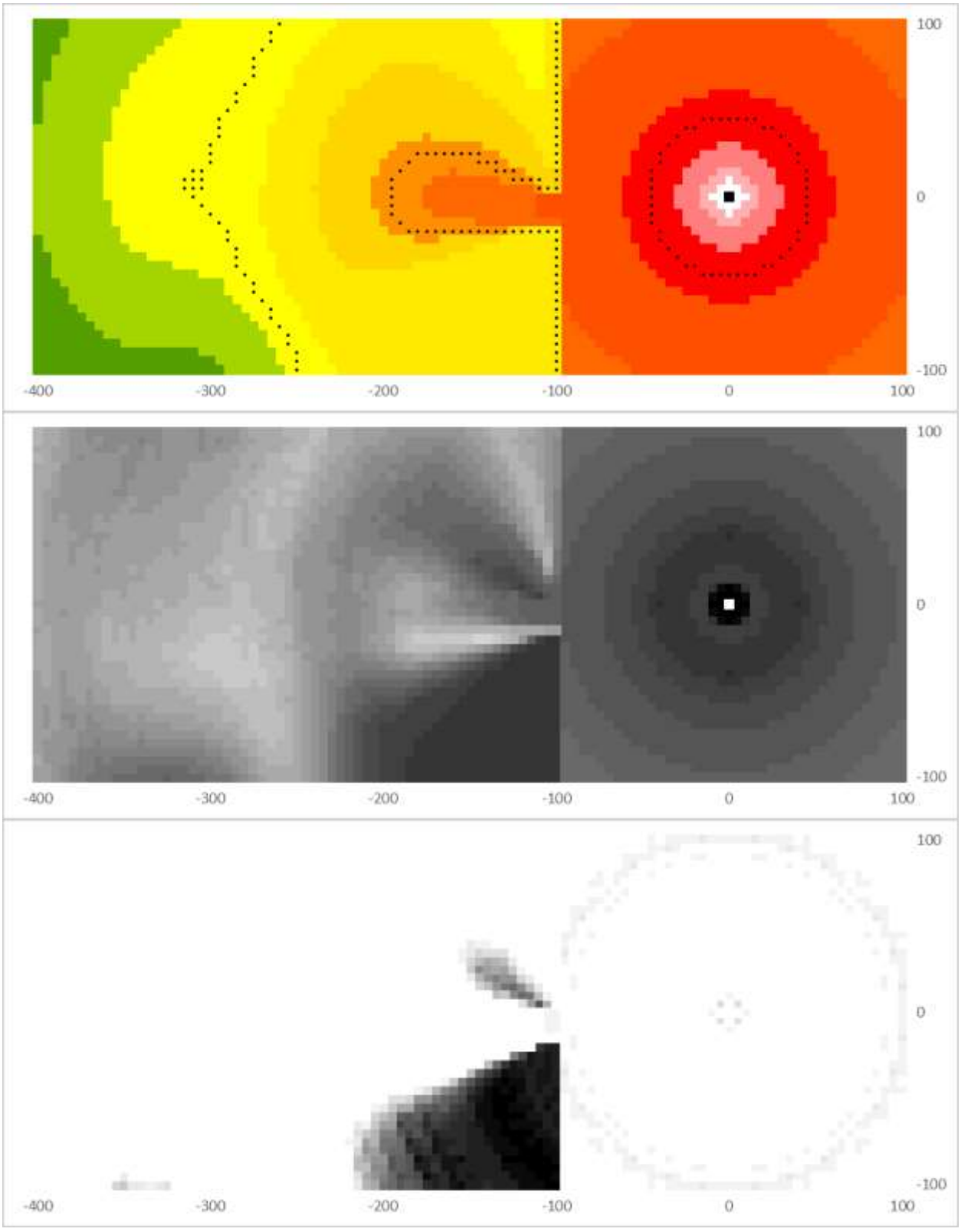
from lies that are about a full drive from the mando,

for players that aim at the mando, from lies that create a sharp angle to get through the mando, and

for players that always aim at the target, in the area where aiming at the target gives them a chance at making or missing the mando.

Note that for players that always aim straight at the target, when they are well to the wrong side of the mando, they all take a penalty and go to the drop zone, so the only scoring spread width is a result of what happens after the throw from the drop zone.

The third chart shows the areas where the scoring spread gets narrower as a result of the new element. These are shown as dark areas. One would want to avoid locating tee pads and mandos in these relative positions to each other and the hole.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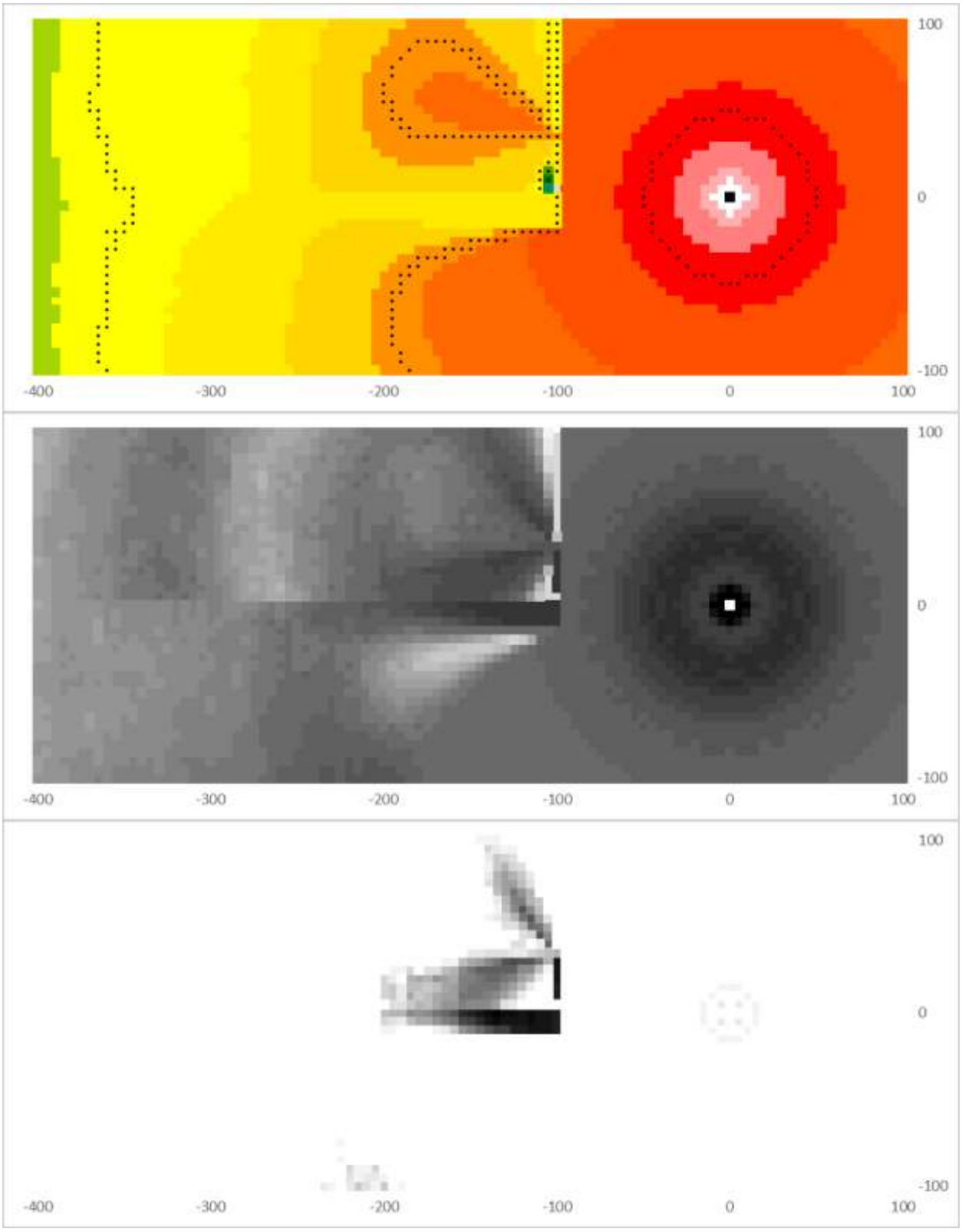
The chart on the next page shows an outside double mando. As before, the players on the top half are trying to make the mando (barely), while the players on the bottom half always aim at the basket.

What these charts show us is that the question of where players would aim becomes important. Presumable, the players would not aim at the target through the forbidden zone. Nor would players who have landed well away from a mando object choose not to aim at the target.

What that implies is that for each different lie there is an optimal point to aim for. Solving for that optimal aim point is not trivial. Also, the question of how many players would go for the optimal point (as opposed to maybe the second most-optimal point) comes into play. So, I stopped here for now.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