Alice is not impressed by the Sorities Paradox

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Bob, in order to impress Alice, decides to amuse her with the Sorities Paradox. The conversation goes like this:

Bob: See that tree over there. It's far away right?
Alice: Sure.
Bob: But if I was standing right in front of it it would not be far away, it would be near.
Alice: For sure.
Bob: And from points in between the tree may be far or near.
Alice: Sounds reasonable.
Bob: And if you're at some point in between which is far from the tree and you move 1mm forward towards the tree then clearly you'll still be far from the tree.
Alice: Hmm, I guess.

At this point Bob plays his trump card pointing out that starting where they are and moving 1mm at a time towards the tree and the tree will remain 'far' throughout, so will still be 'far' even when they arrive right next to the tree.

Unfortunately Alice doesn't seem quite as impressed as Bob hoped. The resulting conversation goes like this.

Alice: Well obviously then you can't be right, it must change from far to near at some point. Unfortunately we don't have time to actually do your experiment to find out where it is but we can if we try it another way. Let's walk half way. If I still think it's far then this point must be between that point and the tree. On the other hand if I think it is then near we know the point must be between our start and this mid-point. So now we've trapped the point in an interval half what we started with. Repeating it we can go down to a quarter of the original distance, and so on. Since the tree is at most 100m away we will determine this point in about $\log_2(10,000) \leq 14$ steps, which we do have time for.

Bob: Oh.

When they do attempt this experiment there are now two possibilities. The first is that they capture the point.

Alice: OK, so I was wrong not to object to your assertion *And if you're at some point in between which is far from the tree and you move 1mm forward towards the tree then clearly you'll still be far from the tree* at the time, we now see it is is false.

The other possibility is that at some point Alice simply isn't able to say if the tree is far away or not.

Alice: OK, so I was wrong not to object to your assertion *And if you're at some point in between which is far from the tree and you move 1mm forward towards the tree then clearly you'll still be far from the tree* at the time. For how could I agree to it if in general I cannot even tell if a point is far or near to the tree? I was clearly wrong to go along with this assumption of yours.

Bob: So you don't think there's a paradox here?

Alice: No.

Bob to himself: Don't know why I ever wanted to impress her in the first place.