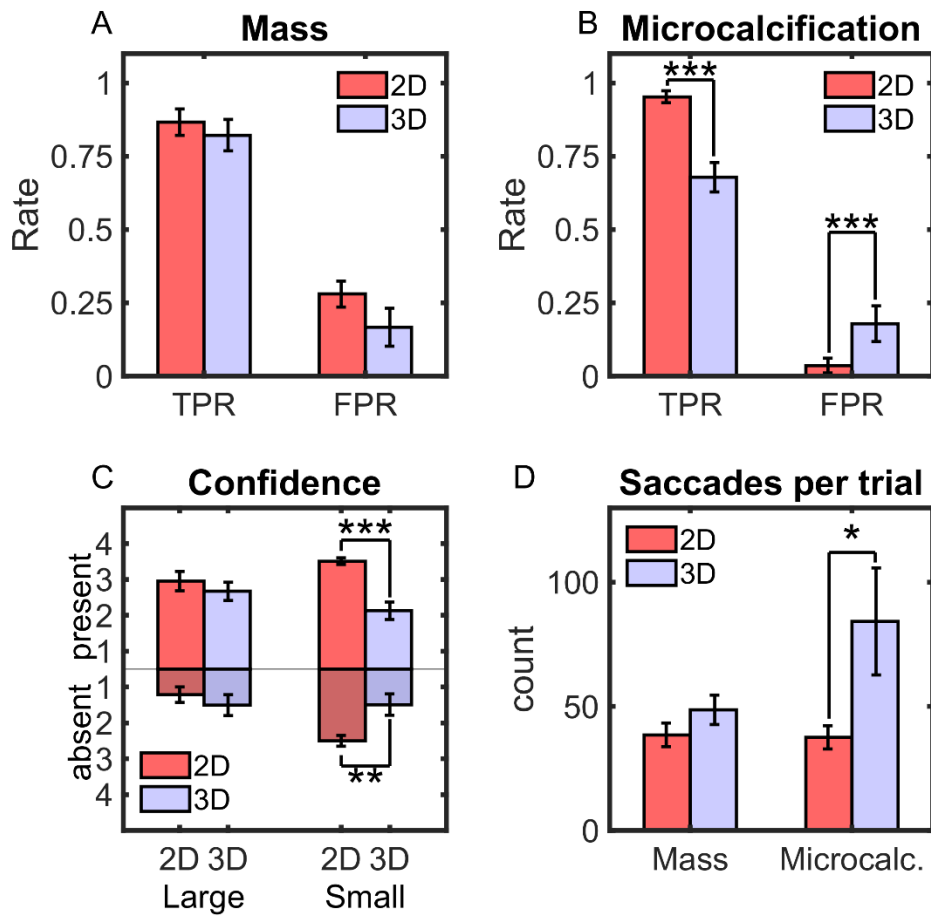


**Figure S1: Additional results for the search experiment in synthetic noise images, related to Figure 1**

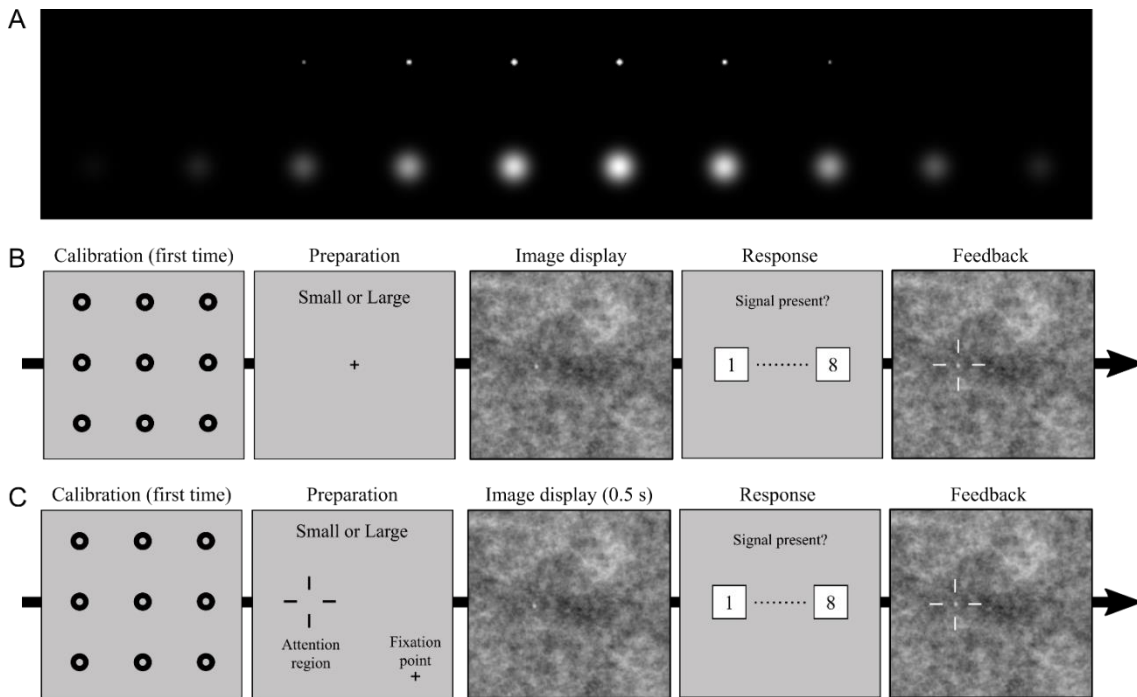
(A) Average true positive rate (TPR) and false positive rate (FPR) for human observers for the large target. (B) Average true positive rate (TPR) and false positive rate (FPR) for human observers for the Small target. (C) Observers' confidence when responding to target present and absent trials. (D) Performance for observers in a 2D and 3D search experiment using a different contrast (contrast for large target was 2% higher, contrast for small target was 45% lower). (E) Performance for two observers in a 2D and 3D search in synthetic noise backgrounds with signal uncertainty (this experiment was performed online on each participant's personal computer due to covid 19). (F) The average number of saccades per trial for 2D and 3D search for the large and small targets. There is an increase in the number of saccades for 3D search of the large (a factor of ~2.5 times relative to 2D search) and the small target (a factor of 6). This increase does not compensate for the 100-fold increase in the search space between 2D and 3D images.

Error bars are standard errors of the mean. \* p < 0.05, \*\* p < 0.01, \*\*\* p < 0.001



**Figure S2: Additional results for the search experiment in synthetic noise images, related to Figure 4**

(A) Average true positive rate (TPR) and false positive rate (FPR) for radiologists for the mass target. (B) Average true positive rate (TPR) and false positive rate (FPR) for radiologists for the microcalcification. (C) Radiologists' confidence when responding to target present and absent trials. (D) The average number of saccades for radiologists per trial for 2D and 3D search for the mass and microcalcification targets. Error bars are standard errors of the mean. \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$



**Figure S3: Illustration of the generated signals and experiment outline, related to STAR methods**

(A) Example of several slices of the region of interest around a 3D simulated small target (top) and large target (bottom) embedded in noise samples. Images are enlarged for visualization. (B) Timeline of the procedure for the 2D and 3D search experiments. There was no time limit to reach a decision. (C) Timeline of the procedure for the experiment measuring target detectability as a function of the retinal eccentricity. A fiduciary cue (attention region in figure) indicated the location of the target.