1. brute force, enumerate a vertex of the square. $O(n)$ per operation.
2. dividing rows/columns into heavy and light, and periodically rebuild. $O(n^{2/3})$. see my solution https://leetcode-cn.com/problems/detect-squares/solution/on23de-suan-fa-by-hqztrue-9ki5/.

remark. if there are no duplicate points, then we can get $O(\sqrt{n})$ per operation, by dividing rows/columns into heavy and light (heavy iff size $\geq \sqrt{n}$).

References