

1 matches because either you're using all the peaks or
2 a subset of the peaks as indicated in Column 12 --
3 somewhere it says -- let me find it. Yeah --
4 lines 6 and 7, you have the option of unmarking
5 peaks, which is disclosed in Iwamura.

6 So as soon as you evaluate only a subset
7 of the number of locations, you get sublinear time
8 search, because all it takes is -- if the length of
9 my string is, say, N, and the number of peaks or the
10 number of positions that I'm evaluating is sublinear
11 in N, I get a sublinear search.

12 Q You said if it's sublinear in N, but it's
13 not, sir.

14 A It is.

15 Q Would you agree that as we increase the
16 size of the database --

17 A Right.

18 Q -- the dataset we're searching, that the
19 amount of search time will be linear?

20 A It's linear only in the size -- in the
21 number of musical works. But, again, another
22 dimension, as we have said, is the length of each
23 musical work.

24 Q But lengthening the work doesn't reduce
25 the number of peaks.

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21 number of musical works. But, again, another
22 dimension, as we have said, is the length of each
23 musical work.

24 Q But lengthening the work doesn't reduce
25 the number of peaks.

1 A Well, you can unmark them.

2 So if I'm using 20 percent or if I'm using
3 5 percent, I'm -- I'm reducing my search speed
4 accordingly.

5 Q Let's take it one step at a time.

6 A Yes.

7 Q Case 1. We lengthen the number of musical
8 works.

9 Would you agree that Iwamura is not
10 sublinear in that sense?

11 A We increase the number of linear -- yes, I
12 agree.

13 Q Now, we increase the size of the musical
14 works. We don't unmark any peaks; we just increase
15 the size of the musical works.

16 Would you agree that Iwamura is not
17 sublinear to increasing the size of the dataset
18 then?

19 A It is sublinear in the size of the
20 dataset. All it takes is to use a fraction of the
21 data that is sublinear, which is what everyone will
22 do.

23 Q Okay. Then I'm talking about what Iwamura
24 teaches. I'm not talking about modifying it by
25 taking a fraction of the data.

1 A This is what everyone does.

2 So when you do string matching, you are --
3 this technique is known as subsampling; right? It's
4 very common. You -- you try to evaluate matches,
5 and you only evaluate a certain number of positions.

6 If you have more and more data, you can
7 get away with subsampling even more, meaning you
8 look at an even smaller fraction of possible
9 matches. That's always how you get sublinear time.

10 Q Does Iwamura teach that as we increase the
11 size of our dataset or the size of the song, that we
12 are going to then change the number of samples that
13 we're going to look at?

14 A It says it's an option that the user
15 can -- can select. I mean, this is --

16 Q Where?

17 A Well, again, if you look at Column 12 --

18 Q Okay. Does Column 12 say anything about
19 if we increase the size of the dataset, we're going
20 to then reduce the number of peaks that we look at?

21 A The user defines -- it's very clear.

22 Okay. It says you can select. So you
23 select -- you unmark peaks; therefore, you select a
24 subset. This is up to the user. So all the user
25 has to do -- of course, the user could choose not to

1 do that or the user could do that in a way that
2 depends on the length of the musical work.

3 Q I didn't ask you what Pierre Moulin, as
4 the user, could do --

5 A Right.

6 Q -- with all of his knowledge, in 2015,
7 sitting here in this deposition. I'm asking you
8 about what's taught here.

9 A Yeah.

10 Q So let me ask you a specific question.

11 A Right.

12 Q Does this column -- first of all, you're
13 pointing to Column 12, lines 5 through 9; is that
14 right?

15 A Yes.

16 Q Does that -- in Iwamura, Column 12,
17 lines 5 through 9 -- state that the algorithms
18 should be run as one option by reducing the number
19 of peaks if the size of the database increases?

20 A It does not say what you just said. It,
21 however, discloses that you can select how many
22 peaks you use for -- for matching. And it's not
23 Pierre Moulin in 2015 who is saying this; this was a
24 technique that was used in the '80s already. It's a
25 very old technique.

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