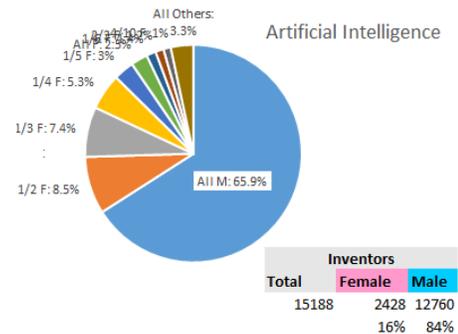


Gender parity in AI a 'crisis'. There are worse, and better, cases.

By [Joe Chiarella](#)
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A few days ago a news article caught my eye titled "Artificial intelligence industry facing a 'diversity crisis' because it is overwhelmingly white and male, study finds". Click [here](#) to go to that article or click [here](#) to read the actual study report from AINow.

The study and article suggest that females (and minorities) are disproportionately under-represented in the Artificial Intelligence industry - and hints that it is a consequence of some underlying unconscious bias at best or, at worst, a deliberate effort to keep women out of the field. I don't challenge the general argument that women are under-represented in all kinds of STEM fields - in fact I've been ringing that bell for several years. But I do wonder why so much attention is focused on the "bias" in AI and other "sexy silicon valley" endeavors, while ignoring others, with the subtle or outright assertion that this is a deliberate effort.

In a desire to look at this through a measurable metric, I look to patents. Having over 3.7million US Patents in the [Patent Index](#) database, along with other demographic, geographic, gender and other data - I thought I would see if female representation in AI is disproportionate from other subject areas. While inventors of patents is only one way to measure female participation in STEM industries, it is still a quantifiable measure. What do you think the data shows?

AI is neither unusual nor egregious. There are industries far worse for women. Here is a top level view at just a few areas of patent activity:

	Patents	Inventors			Female
		Total	Female	Male	Percentage
Artificial Intelligence	4396	15188	2428	12760	16.0%
Autonomous Vehicles	1998	6675	705	5970	10.6%
Blockchain	119	396	45	351	11.4%
"Cancer"	18135	97230	25408	71822	26.1%
Internal Combustion Engine	19405	68263	5643	62620	8.3%
"Pollen"	245	1184	311	873	26.3%
Robotic Surgery	310	1447	95	1352	6.6%
Compositions for Skin	2779	12156	3813	8343	31.4%

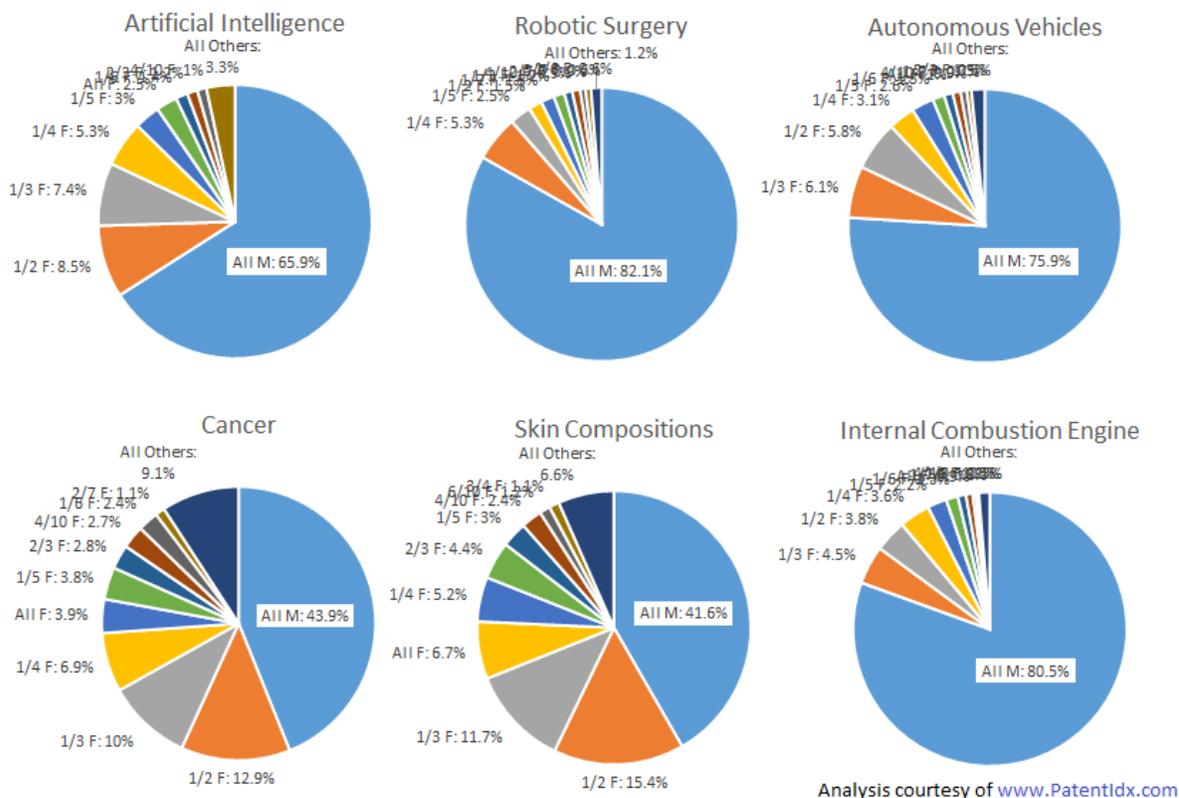
Analysis courtesy of www.PatentIdx.com

As the adjoining table shows, in terms of patents for Artificial Intelligence, females make up 16% of all inventors in that space. For all inventors of all patents in 2017, females comprised 14.7% of them. (That fact, and many more about [Gender in Invention](#) can be found in my report

on that topic released in Aug 2017 or you can view the Feb 2019 US PTO report [here](#).)

But I didn't stop at the overall counts. Patents are often the product of a team of inventors. So, I dug deeper, again, to see if inventor teams in AI were unfairly treating women. Here are a few of the findings (areas of invention chosen more or less randomly):

Female Inventor Representation for Patent Inventor Teams



In addition to AI, we can see five other areas of invention and how women are represented in the inventor teams contributing to patent creation.

The big blue slices show the percentage of patents where the inventor team is all male. Everything else is a breakdown of teams with some level of female representation. In the case of AI, 66% of all patents have all male teams. 1% of all AI patents have all female teams. 9% of all AI patents have teams that are half female (or half male depending on which way you see the glass). 8% of all AI patents have teams that are 1/3 female. And so on.

So, I close in on my point.

Let's look at invention for internal combustion engine related patents. 81% of all patents have all male teams! Of the mere 19% that have some level of female representation (vs 34% in the case of AI) - you have to dig down to the 4% slice where half the team is female. You can find only 0.97% of all patents with an all female inventor team. Who will stand up for the bias in invention by women in the auto and other internal combustion engine industries?

Worse yet is robotic surgery where a mere 17% of teams have at least one woman (literally HALF the percentage in AI). As shown above, in a field with over 1400 inventors, less than 100 are female. Where is the outrage for female robotic surgery inventors everywhere? Do they not deserve our support? There are plenty of other disciplines that are far worse off than AI, but AI gets the attention; why?

I genuinely wonder why there is such outrage in some pockets of the tech-world and not others? There is an "activism" that pervades certain industry sectors that doesn't seem to extend to other industry sectors where this problem is even more egregious. Why?

There is, however, good news also. If you examine the above table and two of the pie charts - you'll see that female inventors are far more likely to be involved in patents related to cancer, or pollen (mostly plant patents) or to skin compositions. In fact, I take it as great encouragement that these areas of invention (there are more) can boast around twice the national average of female inventors as a percentage. It is even more encouraging to realize that in both cases, the percentage of all male inventor teams is now below the halfway mark, or put another way, more than half of all patents in these fields have female inventors involved. Women are making progress in certain areas and in certain geographies.

Perhaps if we focus on where there is real progress, we can figure out how to make more progress in other areas. In other words, will we make more progress by learning from success than, well, focusing on failure? Either way - we should look at the whole problem. Gender parity is not what it should be in AI, but "activism" needs a broader brush.

What are your thoughts?