Patenting Uyghur Tracking - Huawei, Megvii, More

A patent application authored by Huawei and the PRC government includes Uyghur-detection analytics, in the latest proof that the China tech giant uses this racist technology.

This comes after IPVM and The Washington Post exposed last month that Huawei and Megvii, a Chinese facial recognition startup, tested and validated 'Uyghur alarms', provoking a global controversy when a French soccer star dropped Huawei as a sponsor.

Now, IPVM has found that Huawei, Megvii, and several other PRC tech companies have filed patents in China for various devices and systems that include Uyghur and ethnic minority detection.

IPVM is publishing this article in conjunction with the BBC, which has done its own investigation.

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Background

In China, AI software that can automatically detect whether someone's face is Uyghur is widely deployed across police security camera networks. The systems generally detect whether someone's face looks Uyghur, Han (China's ethnic majority), or 'other', meaning they specifically target Uyghurs, a highly repressed minority.

The PRC government has even included these analytics in facial recognition guidelines. Many top China security camera manufacturers offer 'Uyghurs analytics', including the country's three largest: Hikvision, Dahua, and Uniview.

Huawei And PRC Government Patent

In a July 2018 patent application jointly authored by Huawei and the Chinese

Academy of Sciences (CAS) for the "identification of pedestrian attributes", Uyghurs are referenced as one "race" that "can be" detected in the "target" pedestrian:

> For example, the target object is a pedestrian. The attributes of the target object can be gender (male, female), age (such as teenagers, middle-aged, old), **race (Han, Uyghur)**, body (fat, thin, standard), top [clothing] style (short sleeve, long sleeve), top color (black, red, blue, green, white, yellow), etc. [emphasis added]

The patent overall is described as being for an "object attribute recognition method, device, computing equipment and system". CAS is the PRC government's top research arm, with a $15 billion budget last year. The PRC government has been widely criticized for repressing Uyghurs.

Huawei Will "Amend" Patent Application

In response, Huawei said Uyghur analytics "should never have become part of the [patent] application" and is "taking proactive steps to amend" this:

> Huawei opposes discrimination of all types, including the use of technology to carry out ethnic discrimination. Identifying individuals' race was never part of the research and development project. It should never have become part of the application and we are taking proactive steps to amend it. We are continuously working to ensure new and evolving technology is developed and applied with the utmost care and integrity.

However, the word "proactive" is questionable because Huawei is only addressing this after IPVM/BBC brought up the issue. A truly proactive response would have been to find these patents/systems and address them in advance in a transparent manner. IPVM has asked Huawei about this, along with the nature of its relationship to CAS. We will update upon response.

UPDATE: Huawei's patent was granted in May 2022, however, under a slightly altered form which omitted any mention of Uyghur analytics or race detection in general.

Megvii Patents

Megvii is one the PRC's largest facial recognition startups, with revenue of around $300m in 2019, Bloomberg reported. In a patent application filed in June 2019 for a

"portrait retrieval method and device" powered by a "neural network" that "extracts [facial] features", Megvii mentioned "ethnicity classification" including "Han, Uyghur, non-Han, non-Uyghur, and unknown":

> It is necessary to divide the **ethnicity classification standards**, for example, [the portraits] can be divided according to Han, non-Han and unknown. Similarly, it can also be based on actual needs [...] for example, it can be divided according to Han, non-Han and unknown, **or according to Han, Uyghur, non-Han, non Uyghur,** and unknown [emphasis added]

The patent notes that the device "can also directly connect to the facial recognition that has been built by the public security organ" i.e. police. The patent mentions facial recognition repeatedly, noting its current ubiquity in the PRC:

> with the in-depth development of [China's] smart city, safe city, and Sharp Eyes project strategies, [video surveillance] coverage has been gradually established, **face recognition system** in public areas and key areas. The **recognition system** can capture and **recognize** passing passerby [...] For the captured portrait data, **using face recognition**, **the system can analyze** the features value and **structured attributes of each face**, such as gender, age group, etc
> [emphasis added]

This patent's co-author, Liu Ruiwei, is quoted by China Daily in early 2020 as a "senior product manager" at Megvii. Additionally, a separate patent filed by Megvii in 2017 for a "Method, device and computer memory for evaluating face recognition algorithm" mentions "minority" ethnicity detection, stating "Race (minority) can include yellow race, black race people, white people, etc."

As noted, Megvii and Huawei tested and validated 'Uyghur alarms' in early 2018. When IPVM and The Washington Post revealed this, Megvii claimed "our solutions are not designed or customized to target or label ethnic groups." However, these patents show the opposite.

Megvii Claims "Misunderstanding"

In response, Megvii said the 2019 patent "is open to misunderstanding" and "is in no way an intention to develop ethnic identification solutions":

> Megvii recognizes that the language used in our 2019 patent application is open to misunderstanding. The patent application pertains to technology to re-label images based on existing attributes provided by third parties, where

some of them might have been labeled incorrectly, in order to facilitate portrait retrieval. This functionality, which re-labels images using such attributes as age, gender and ethnicity, is in no way an intention to develop ethnic identification solutions. Megvii, moreover, has not developed and will not develop or sell racial or ethnic labelling solutions. Megvii acknowledges that in the past, we have focused on our commercial development and lacked appropriate control of our marketing, sales, and operations materials. We are undertaking measures to correct the situation.

Megvii told the BBC it would "withdraw" the 2019 patent.

IPVM Response to Megvii Statement

There is no "misunderstanding" about this patent:

Megvii says the patent "is not a facial recognition solution" yet the patent explicitly states that the method/device can be "directly connect to the facial recognition that has been built by the public security organs".
Megvii says the patent does not represent "an intention to develop ethnic identification solutions" however, the patent openly includes "Han, Uyghur, non-Han, non-Uyghur, and unknown" as ethnic categories that can be recognized.

UPDATE: Megvii also withdrew its patent but much faster than SenseTime, only two weeks after IPVM's article was published.

SenseTime Patent

SenseTime is the PRC's largest facial recognition/AI startup, with a reported ~$750m in sales for 2019. In a patent filed in July 2019 by SenseTime for a "Method and device for retrieving images", SenseTime mentions "Uyghurs" as one of the "ethnicities":

The above calculation method is also applicable to structured attribute tags such as age group and **ethnicity**. Among them, the age can be divided into age groups according to actual needs, and there is no restriction on the criteria for dividing age groups. In the same way, it is also possible to divide the ethnicities according to actual needs. For example, it can be divided according to **Han, non-Han and unknown, or according to Han, Uyghur, non-Han, non Uyghur, and unknown**.
[emphasis added]

The patent even includes a Uyghur man as an example of a "target image", allowing a user to input several values ("Uyghur", "sunglasses", "beard", "male") to find a person with the same "face attributes":

> For example, the reference face attribute is: **a middle-aged Uyghur man with sunglasses and a beard.** Using the referenced face attributes to search the database [...] including images with glasses style as 'sunglasses', beard type as 'beard', age group as 'adult', **ethnicity as 'Uyghur',** gender as 'male', to **obtain the target image** [emphasis added]

SenseTime Says Patent "Regrettable", Will "Update"

SenseTime said the patent was "regrettable" and that it would "update" it "at the next available opportunity on record":

> This particular AI research includes facial recognition of all ethnicities without prejudice. The reference to Uyghurs is regrettable and is one of the examples within the application intended to illustrate the attributes the algorithm recognizes. It was neither designed nor intended in any way to discriminate, which is against our values.

SenseTime also noted that SenseTime is a is "a fast-growing young company" and touting its ethics code:

> SenseTime is a fast-growing young company in an even faster evolving industry. We understand the importance of our responsibilities, which is why we began to develop our AI Code of Ethics in mid-2019. The development of the AI Code of Ethics has helped inform all aspects of our business from R&D to processes. We're committed to working with the industry and at an academic level in evolving this, to ensure responsible and sustainable development of AI technology.

SenseTime's AI Code of Ethics does not address Uyghurs or ethnicity-detecting AI software. It does note that "biases in historical data might result in an algorithm discriminating against a certain age group, race or gender".

UPDATE: SenseTime withdrew its patent mentioning Uyghur analytics in March 2022, 14 months after the IPVM article was published. It also removed mentions of the word "Uyghur" (claiming this as a "correction") two months after this article was published:

Alibaba Patent

Alibaba is [known](#) as the 'Amazon of China' and currently has a ~$615 billion market cap. [A patent filed by Alibaba in 2018](#) for an "image set generation method, device and image recognition module" includes "race, ethnicity" as possible "applications":

> For example, if a company wants to use face recognition technology to check attendance, then each employee of the company can be regarded as a category, so that after classifying the image, you can identify which person it is. Of course, in other applications, **categories can be divided according to race, ethnicity**, or region. [emphasis added]

However, Uyghurs are not mentioned. IPVM reached out to Alibaba asking what ethnicities/races are referenced in this patent. As IPVM and The New York Times [reported in December](#), Alibaba Cloud offered Uyghur recognition as a service openly [on an API](#) [guide](#) on its China website, taking it down after this was exposed:

Alibaba Response

Alibaba did not address the patent directly, instead stating "ethnic discrimination [...] violates our policies and values":

> Racial or ethnic discrimination or profiling in any form violates our policies and values. We never intended our technology to be used for and will not permit it to be used for targeting specific ethnic groups."

Baidu Patent

In 2019, Baidu, the 'Google of China' with a ~$75 billion market cap on the NASDAQ, [filed a patent](#) for an "Image retrieval method and device" which includes "ethnicity" in its "attribute recognition" AI model:

> The attribute recognition model can be used to recognize the attributes of the target in the image. Attributes can include but are not limited to the target's gender, age, **ethnicity**, etc. [emphasis added]

The patent does not mention Uyghurs or what ethnicities are included.

Baidu Response

In response, Baidu said it has "never developed or permitted its technology to profile any ethnic group", saying the patent does not represent "the expected implementation of the invention":

> Baidu has never developed or permitted its technology to profile any ethnic group. Our existing facial recognition offering is not capable of detecting ethnicity as an attribute. When filing for a patent, the document notes are meant as an example of a technical explanation, in this case describing what the attribute recognition model is rather than representing the expected implementation of the invention. We do not and will not permit our technology to be used to identify or target specific ethnic groups.

However, the patent itself does not state that ethnicity detection is off-limits. IPVM asked Baidu about this discrepancy, we will update upon response.

Intellifusion Patent

Intellifusion is another PRC AI/facial recognition startup which raised almost $141m in a pre-IPO round last year. An Intellifusion patent filed in 2018 for an "image retrieval method and device" includes Uyghur detection:

> For the ethnicity attribute field, 0 can be used to represent the Han ethnicity and 1 to represent
> minority ethnicities such as foreigners or **Uyghurs**

Intellifusion did not respond to requests for comment.

SensingTech Patent

SensingTech, another China facial recognition startup, filed a patent in 2019 for an "aggregation method of pedestrian [image] library based on face recognition" which picks out Uyghurs as one of "two categories":

> Ethnic minorities are divided into two categories (Han ethnicity, **Uyghur ethnicity)**

SensingTech did not respond to requests for comment.

Analysis

The fact that multiple top China tech companies have openly included Uyghur tracking in their patent filings shows how prevalent this racist technology is in the PRC. This is a clear example of PRC human rights abuse against Uyghur people, and also represents a long-term risk for the broader video surveillance industry's reputation.

UPDATE: ACLU & Human Rights Watch Response

Jay Stanley, from the ACLU, warned against government abuse of these "powerful" technologies in a statement to IPVM:

> These patents show that "Uyghur detection" was a goal pursued by a wide variety of companies in China. That's a warning of how powerful this kind of video analytics is, how it can be abused, and how companies not just in China but around the world will step up to provide whatever governments and markets ask for.

Maya Wang, from Human Rights Watch, spoke to the "deep racism" behind the PRC's demand for Uyghur analytics:

> One technical requirement of the Ministry of Public Security's video surveillance networks is the detection of ethnicity— particularly of Uyghurs. The requirement reflects the deep racism that underpins policing in China. The idea is that these people, by the virtue of their ethnicity, is dangerous. Given that requirement, it is not surprising that companies selling to the MPS develop such capabilities.

> While in the rest of the world, such targeting and persecution of a people on the basis of their ethnicity would be completely unacceptable, the persecution and severe discrimination of Uyghurs in many aspects of life in China remain unchallenged because Uyghurs have no power in China.