연관된 이미지 변환하기

- 태양 흑점스케치로 자기장 지도 생성 -

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Isola et al. (2017) suggested a general-purpose solution to resolve image-to-image translation problems using **conditional GANs**.
Purpose

Sunspot Drawing

1600 - 1800 - 2000

Space Weather Quantities

Magnetogram

1900 - 2000
Purpose

Sunspot Drawing

1612 Galileo Sunspot

1859 Carrington Sunspot

Magnetogram

1900 2000
Data

<table>
<thead>
<tr>
<th>Input</th>
<th>Output</th>
<th>Generation</th>
</tr>
</thead>
<tbody>
<tr>
<td>[1024x1024] Sunspot drawing from Mount Wilson Observatory</td>
<td>[1024x1024] SDO/HMI magnetogram</td>
<td>Carrington sunspot drawing</td>
</tr>
</tbody>
</table>

**Training**
- 2012.01.01 ~ 2014.09.14

**Test**
- 2014.09.15 ~ 2014.12.31

**Generation**
Data

2014, Thursday the 17th of April, 15:30 UT, Seeing ≈ 3.0, 38 (through claws)

▲ SDO/HMI magnetogram
2014.04.17 15:30:00 [UT]
▼ SDO/HMI Continuum
20/4, Thursday the 17th of April, 15:30 UT, Seeing = 3.0, SP (Through air)
Test: 2014.11.29 17:45:00 [UT]

AI-generated magnetogram

SDO/HMI magnetogram
1600

1800

2000

1859

Carrington Sunspot

New York Times 1859

The Auroral Display in Boston.

Boston, Friday, Sept. 2.

There was another display of the Aurora last night, so brilliant that at about one o’clock ordinary print could be read by the light. The effect continued through this forenoon, considerably affecting the working of the telegraph lines. The auroral currents from east to west were so regular that the operators on the Eastern lines were able to hold communication and transmit messages over the line between this city and Portland, the usual batteries being discontinued from the wire. The same effects were exhibited upon the Cape Cod and other lines.

The New York Times

Published: September 3, 1859

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Generation: the Carrington sunspot!

Carrington sunspot in 1859

AI-generated magnetogram
1612
Galileo Sunspot

Galileo was drawing sunspots as early as 1613.

400 YEARS COUNTING SPOTS

SLOW SCIENCE

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Galileo sunspot drawing 1613.06.02 - 1613.07.08

Active

Rotate

▼ SDO/HMI 2017.09.03 – 2017.09.07

3 to September 4, 2017, drawn by a factor of 10.
Galileo sunspot drawing 1613.06.02 - 1613.07.08
THANK YOU!