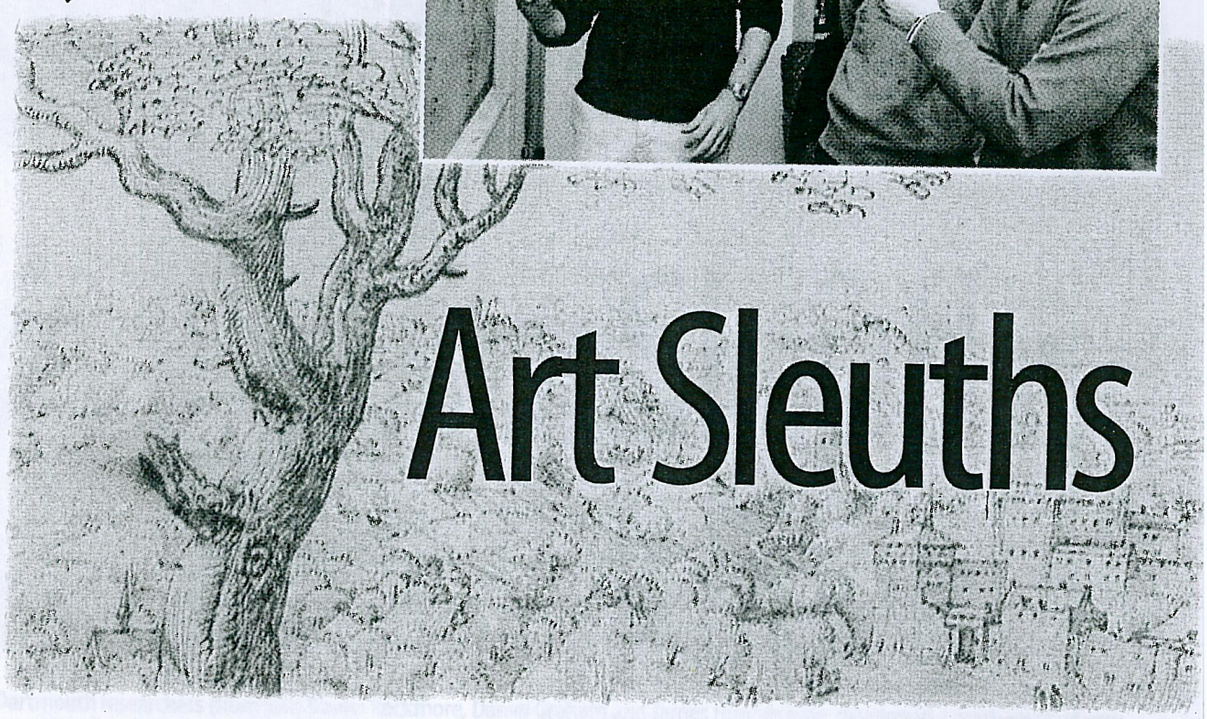
NEW HAMPSHIRE
UNION LEADER
MANCHESTER EDIT
UnionLeader.com Friday, January 8, 2010 Vol. 147, No. 243 • 52 Pages

Dartmouth team spots forgeries by the numbers



Art Sleuths

PHOTO: JOSEPH MEHLING/ DARTMOUTH COLLEGE

Dartmouth researchers (from left) Daniel Rockmore, Daniel Graham and James Hughes have developed a mathematical way to spot art forgeries. Among the artworks they experimented with was this drawing by Pieter Bruegel the Elder, a 16th century Flemish master.

By MELANIE PLENDA
Union Leader Correspondent

A FEW DARTMOUTH College researchers have discovered a way to use math to help detect art forgeries.

With the help of an existing computer program used mainly by neuroscientists, the researchers were able to find a mathematical signature of sorts that distinguishes the work of one artist from another.

Though the study is compelling, the researchers are quick to point out the process is not a magic bullet. But, they said, it does give art curators and historians one more tool to build a case against a fake.

The findings of Daniel Rockmore, Daniel Graham and James Hughes were published this week in the journal, "Proceedings of the National Academy

See **Dartmouth,** Page A12

"You can think of it like notes of chord of music; each (square) is a small part of the whole picture."

DANIEL GRAHAM
Dartmouth researcher

Dartmouth

Continued From Page A

of Sciences."

While art sleuthing is a somewhat "sexy application" of the process, said Rockmore, who headed up the research, the team also believes the full scope of what the process can do has yet to be realized.

"The hope is that the process can be used by technical art historians," Rockmore said. "We hope this is sort of the next generation of tools for technical art historians."

The process uses sparse coding, which in its simplest terms, is a computer program that attempts to replicate the way the brain processes images.

The researchers at Dartmouth came up with the idea of applying the process to works of art, said Hughes.

Rockmore said the process tries to find some statistical regularity among the style of a particular artist in order to compare it to the statistical style of an unknown artist.

"We apply such an analysis to successfully distinguish a set of authentic drawings by Pieter Bruegel the Elder from another set of well-known Bruegel imitations," the Dartmouth researchers said

Bruegel the Elder is a 16th-century Flemish artist.

A set of Bruegel drawings was scanned into a computer at the Metropolitan Museum of Art. Back in the Dartmouth lab, the researchers ran the images through a sparse coding program. The program then virtually dissected the piece into small squares.

"You can think of it like notes of chord of music; each (square) is a small part of the whole picture," said Graham.

Using a system of mathematical equations, each square was digitally broken down to its smallest components. Those components were then analyzed and mathematically recreated. From that, the researchers saw a mathematical pattern emerge

The works of known imposters were also scanned and analyzed.

The fakes were done by several different artists, and the equations generated were unique to each artist.

The researchers then compared all the data and were able to conclude the equations from the Bruegel drawings were more similar to each other than to the imposters' drawings.

Hughes said the team is now working on whether the process can be used on paintings.