happy
[end of applause]

surprised
"no challenge can match the heart and spirit of America"

disgusted
"From this day forward, it's going to be only 'America First'"

sad
"The time for empty talk is over"

angry
"we will make America safe again"
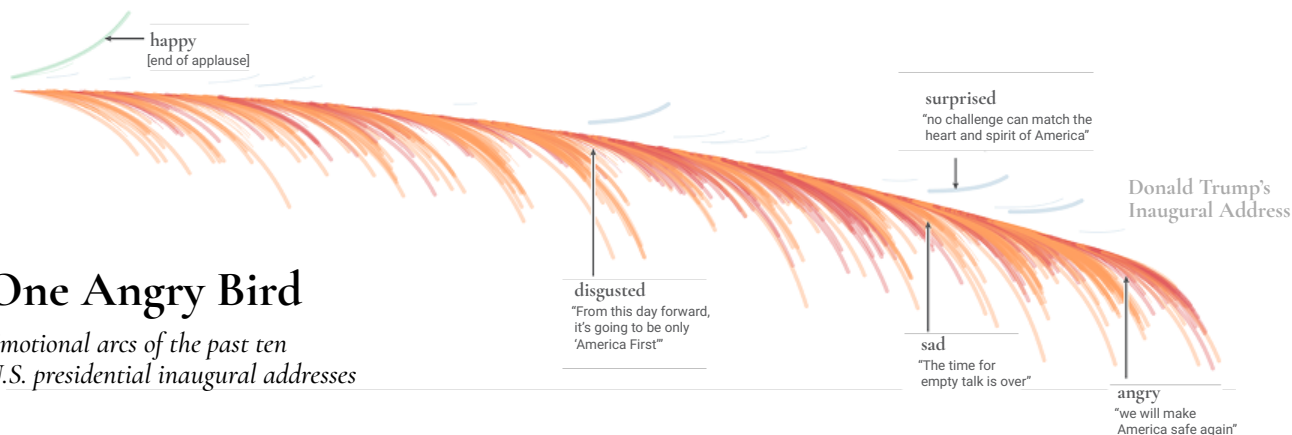
Donald Trump's Inaugural Address
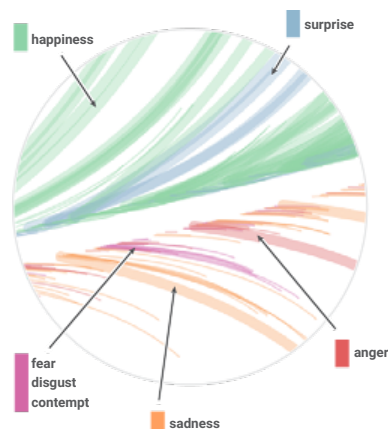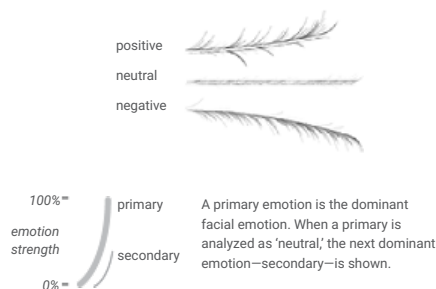
One Angry Bird

Emotional arcs of the past ten U.S. presidential inaugural addresses

Dominant Emotions

We used the Microsoft Emotion API to detect facial expressions of the presidents while speaking. The emotions it identifies are similar to the 7 most widely identified emotions cross-culturally. While this does not provide a thorough analysis of the inaugural addresses, it does show a distinctive negative departure by Trump from the past nine speeches.

Interact with the feathers to see more information and matching video segment for each emotion. Since the Emotion API does not analyze the audio portion, we have removed it.

positive
neutral
negative

100%
emotion strength
0%

primary
secondary

A primary emotion is the dominant facial emotion. When a primary is analyzed as 'neutral,' the next dominant emotion—secondary—is shown.

happiness
surprise
fear
disgust
contempt
anger
sadness

The inaugural address contains the first words uttered by a new president. It is an untarnished moment during which the American leader can set the presidential tone, inspire a country, put an election to rest, and look to the future.

An examination of the facial expressions of the last six presidents during the past 10 inaugurations revealed remarkable differences in the moods and emotions they conveyed. Five of the past six presidents were either positive or measured during their speeches, a striking contrast to the negative countenance found in President Trump's inaugural remarks.

Shown here in the form of collected emotion arcs, each "feather" represents an inaugural address. Each barb of the feather is a moment during the speech where the president displayed an emotion — positive emotions are drawn above the quill, negative emotions below. The length of each barb represents the intensity of the emotion. The curve of the feather itself indicates the overall positivity or negativity of the speech.

Donald Trump   2017   40% negative

After a polarizing election and upset victory, President Trump assumed office with the lowest popular support of any modern president and delivered an address that painted a grim picture of the country. In it, he criticized the Washington establishment and promised that "from this day forward, it's going to be only America first." Protests — some violent — shook the city.

Speech themes: *unemployment, crime, globalism*

49% happiness

Barack Obama   2013   5
2nd term

Shouldered with a largely unfinished to-do list from his first term and gridlock in Congress, President Obama took an unabashedly liberal stance in his speech and defended the importance of government in making change. He laid out his support for marriage equality, action against climate change, immigrant rights, and universal healthcare.
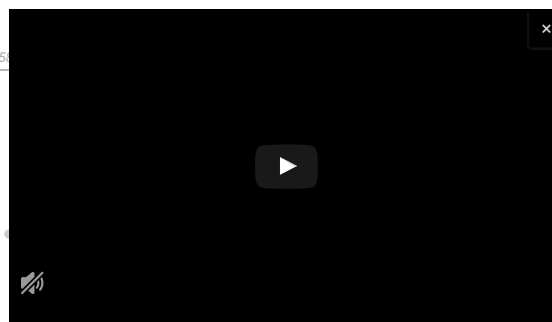
Speech themes: *equality, diversity, climate change, healthcare*

Barack Obama   2009   13% positive
1st term

Making history as the first African-American president, Obama stood before a record-breaking crowd of 1.8 million people and denounced Bush-era policies, calling for a "new era of responsibility." He advocated for traditional American ideals of hard work, sacrifice, and tolerance as the country struggled to recover from a major economic recession.

Speech themes: *economy, environment, war, healthcare*

George W. Bush 2005

2nd term

neutral

Heightened security surrounded the second inauguration of President Bush in the first wartime ceremony in more than three decades. In his "Freedom Speech," Bush defined the course of post-9/11 American foreign policy, pledging to support democratic movements, defend human rights, and "end tyranny in our world."

Speech themes: *promotion of democracy, global human rights*

George W. Bush 2001

1st term

14% positive

Following a controversial election in which he did not win the popular vote, President Bush addressed a crowd that included some 20,000 protesters and sought to unite the divided country. He appealed to his critics, calling for compassion and unity to overcome shared challenges, including improving education and reducing poverty.

Speech themes: *poverty, allies and enemies, community, education*

Bill Clinton 1997
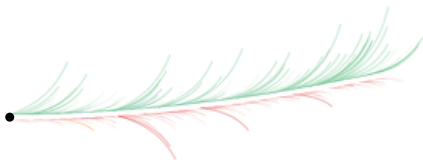
2nd term

55% positive

President Clinton began his second term following four years of economic recovery and decreased military activity. Facing a then Republican-dominated Congress, he emphasized the need for bipartisan cooperation and, honoring the coinciding Martin Luther King, Jr. holiday, spoke of healing racial divides. This was the first inauguration to be broadcast live on the internet.

Speech themes: *citizenship, race, bipartisanship*

Bill Clinton 1993
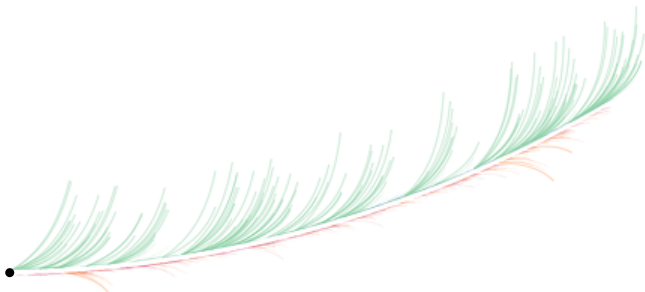
1st term

45% positive

Inheriting relics of the Gulf War and addressing a cautiously optimistic nation, President Clinton vowed to "make a difference" and restore the people's faith in a functioning government, promoting cultural and generational change. Due to a popular third party candidate, Clinton's popular vote percentage was lower than any incoming president since Woodrow Wilson in 1912.

Speech themes: *renewal, globalization, democracy*

George H.W. Bush 1989

66% positive

Bush served as VP in the controversial Reagan years. Facing a fast-changing world including the crumbling Communist empire, Bush announced a dedication to traditional American values and sought to direct them toward making the United States "a kinder and gentler nation." In "a moment rich with promise," he pledged to use American strength as "a force for good."

Speech themes: *bipartisanship, democracy, deficit*

Ronald Reagan 1985

2nd term

74% positive

After winning 49 states in the election, President Reagan opted to hold the inauguration indoors and cancel the parade due to record cold temperatures (7°F). He spoke of continuing the work of his previous term, celebrating the progress of the American people, and concerns about the ongoing Cold War.

Speech themes: *American renewal, reduction*

Ronald Reagan   1981   *46% positive*
1st term

In the warmest inauguration on record and
the first to be held on the West Front of the
Capitol, President Reagan spoke of a new
"era of national renewal" and promised a
reduction of government size and influence.
Other celebratory news of the day was the
release of 52 U.S. hostages from Iran after
444 days of captivity.

Speech themes: *taxes, deficit, role of
government, freedom*

Methods

All emotions were derived using the Microsoft Emotion API on standard video feeds.
This service receives video as an input and outputs a timestamped identification of
emotions detected in any faces present. The emotions detected are anger, contempt,
disgust, fear, happiness, neutral, sadness, and surprise –emotions that are understood
to be cross-culturally and universally communicated with particular facial expressions.

While this set of emotions is culturally the most robust, it is worth noting the imbalance
between positive and negative emotions. There are five negative emotions, one neutral,
one positive, and surprise, which is ambiguous. Secondary emotions are also noted in
the API, and these were used to further classify surprise. Through our analysis of the
video, surprise seemed to be most often grouped with happiness, so we decided to list
it as a positive emotion.

The disparity between negative and positive emotions is not a fluke. Research by
Robert Schrauf, a linguistics professor at Penn State, was conducted on the words we
choose to describe our emotions, and concluded that most of these words tend to be
negative, while only 30% are positive. His theory is that negative emotions require more
thought to rationalize, and consequently generate more words. For instance, fear can
often be a response to a perceived danger, something that requires our attention;
whereas happiness is a signal that all is well and our brain doesn't need to process it
any longer. We've found more ways to describe things that require our attention than
those that don't.

Process
Given that the Microsoft Emotion API can analyze and record the emotions from many
different faces within a frame, we edited each inaugural address to only include the
president speaking. This process required cropping the video, where appropriate, to
occlude any faces seen behind or around the president.

Beginning with Ronald Reagan's first presidential term in 1981, we analyzed every
inaugural address up to Donald Trump's 2017 speech. We limited our selection to these
ten inaugural speeches because they include the last five presidents most relevant to
our public consciousness. We calculated the percentage score and corresponding arc
for each speech by averaging primary emotion strength for all time stamps, with
positive (happiness and surprise) emotions ranging from 0 to 100 and negative
emotions (anger, sadness, fear, disgust, contempt) ranging from 0 to -100.

Accuracy
The API we used for emotion detection solely uses facial expressions for its algorithm.
It does not take into account the words spoken, audio content, or any other context.
Therefore, there are times when the API might mistake smugness for happiness,
sarcasm for surprise, or other nuanced expressions.

Our goal with this exploration was to test the API to determine if it could be a viable
tool to lend additional data to projects that contain video. While we didn't complete an
exhaustive analysis, we do feel the API reveals valuable patterns that might otherwise
be very time-consuming to obtain.

Sources

Donald Trump
Video
Description: The New York Times   The New York Times

Barack Obama — 2nd term
Video
Description: The Guardian   Los Angeles Times

Barack Obama — 1st term
Video
Description: US Senate   The Guardian

George W. Bush — 2nd term
Video
Description: The New York Times   The Washington Post

George W. Bush — 1st term
Video
Description: The New York Times   Los Angeles Times   CBS News

Bill Clinton — 2nd term
Video
Description: US Senate   Los Angeles Times   The New York Times

Bill Clinton — 1st term
Video
Description: Los Angeles Times   CBS News   PBS

George H.W. Bush
Video
Description: CBS News   Los Angeles Times   The White House

Ronald Reagan — 2nd term
Video
Description: US Senate   Los Angeles Times   CBS News

Ronald Reagan — 1st term
Video
Description: US Senate   CBS News