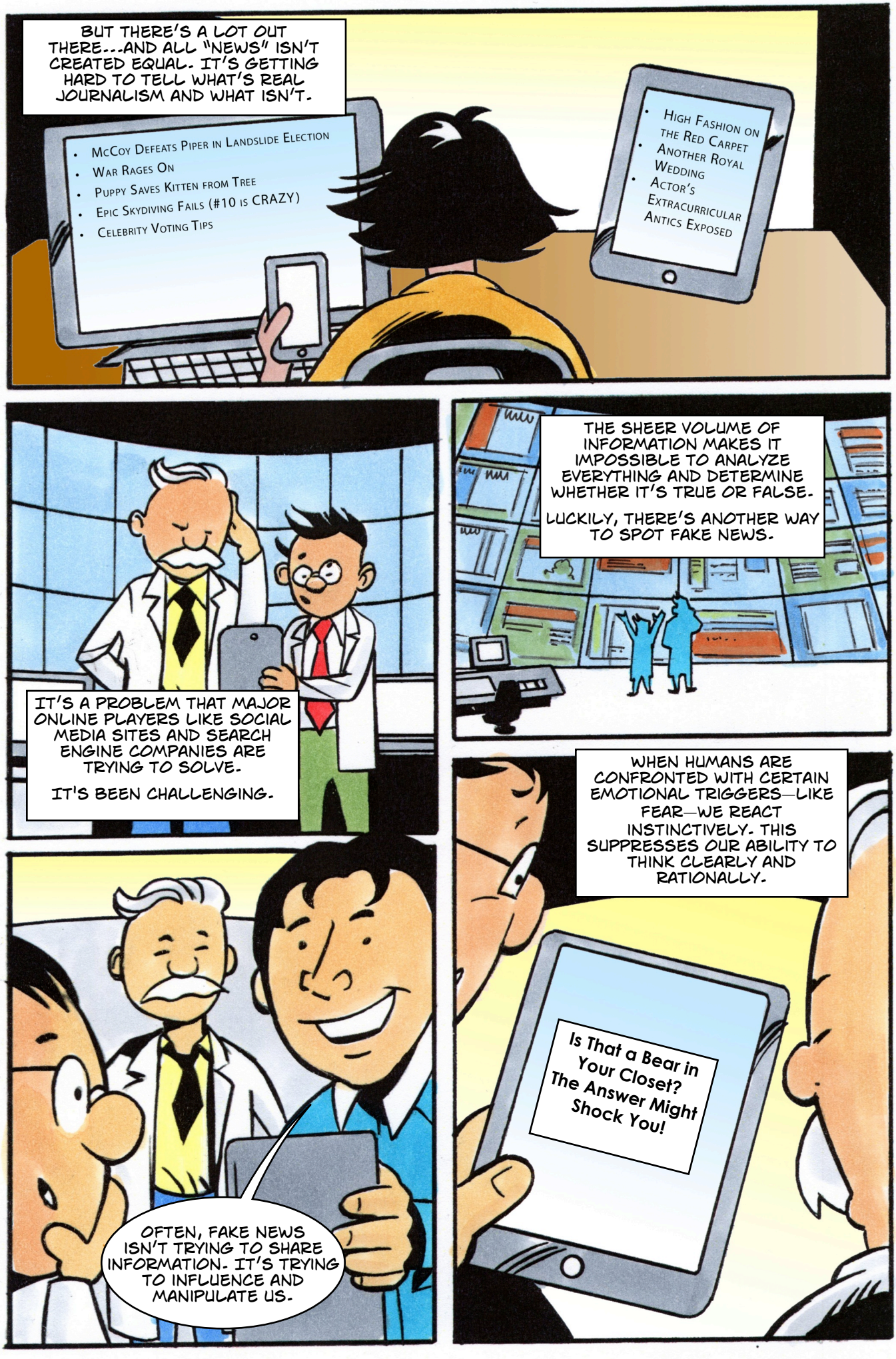
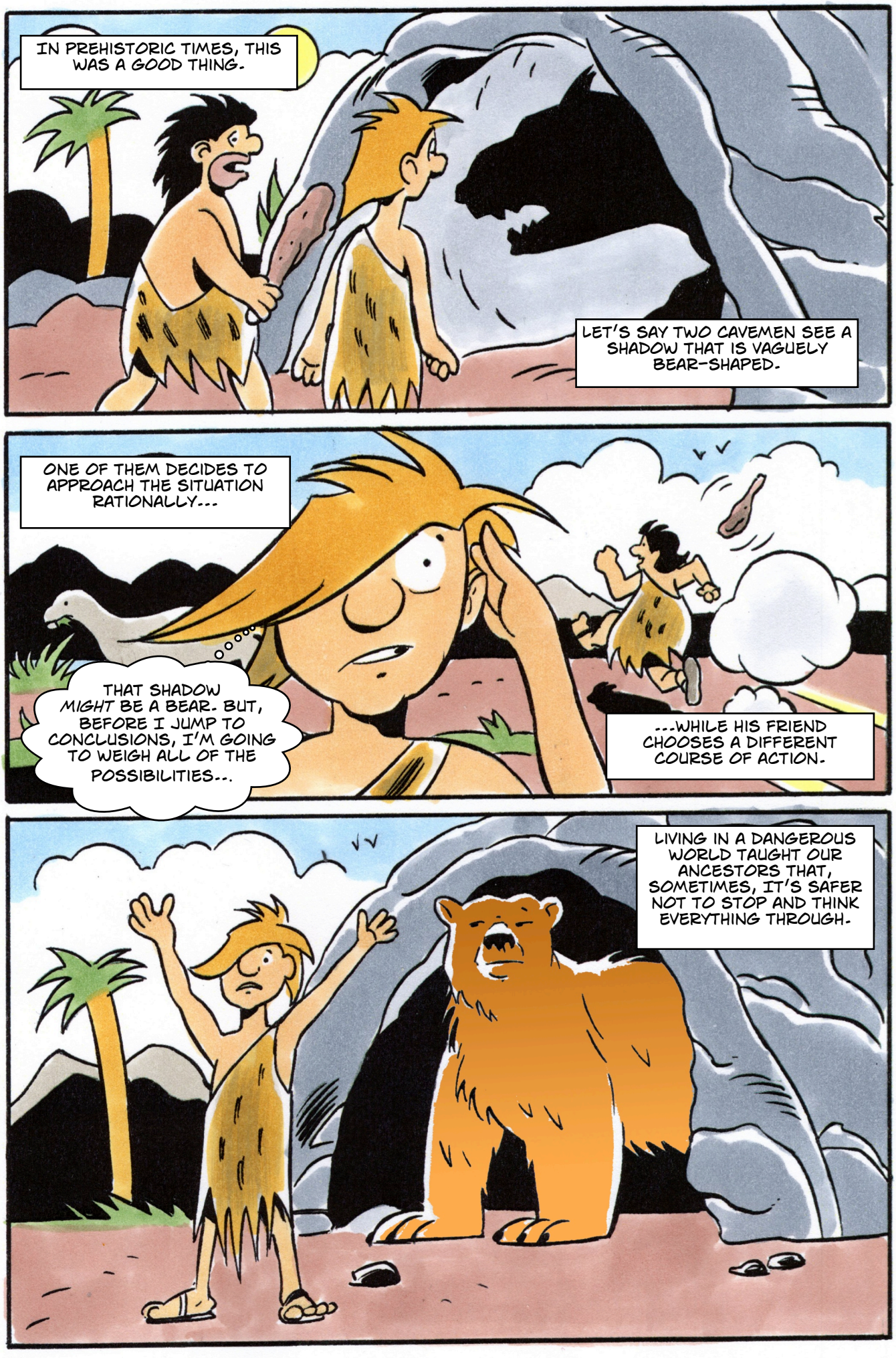
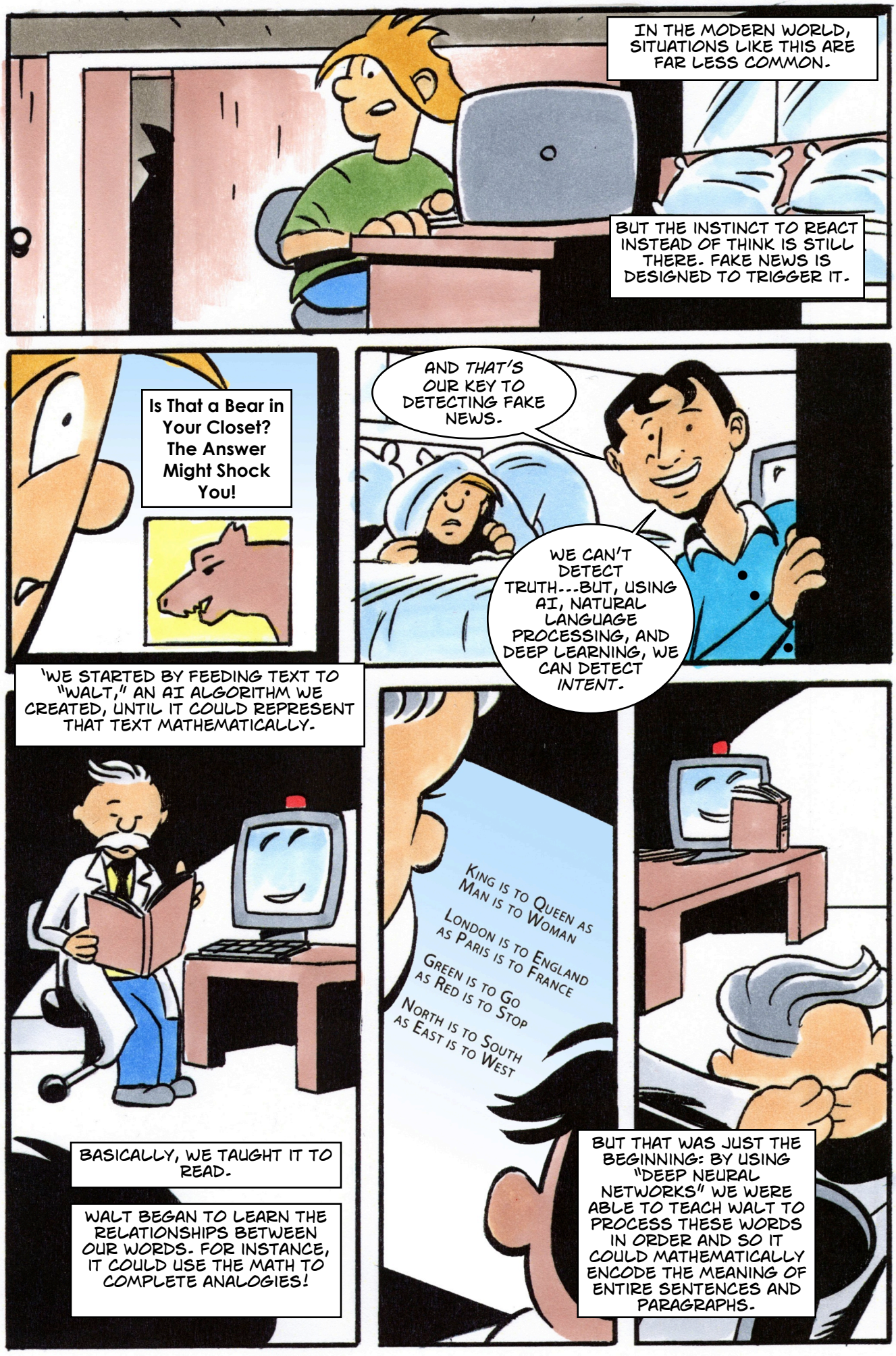
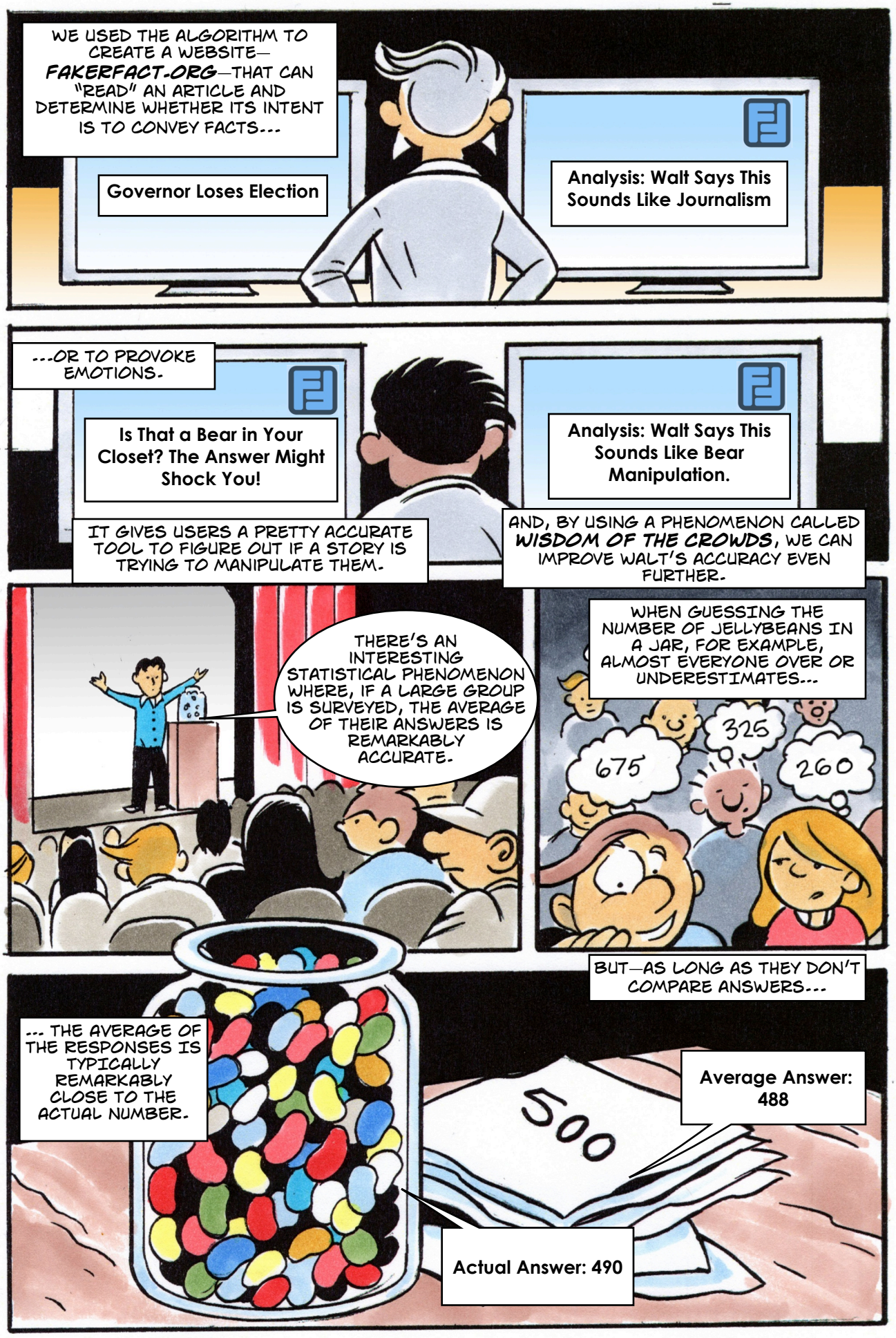
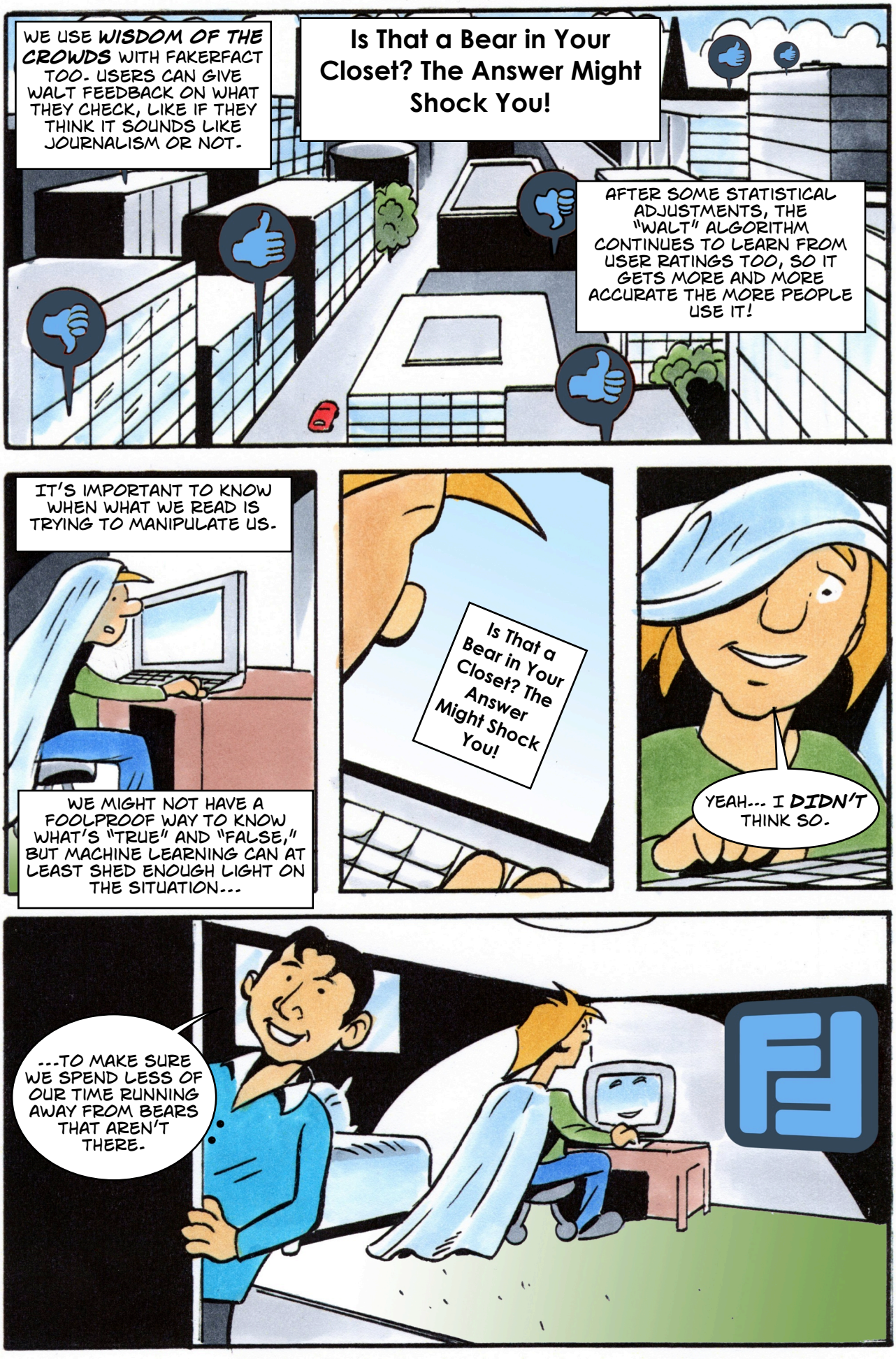
HOW DATA SCIENCE CAN DETECT "FAKE NEWS"
HELLO. I'M WALTER CRONKITE.
WALTER CRONKITE
AWARD-WINNING NEWSCASTER
THAT'S NOT TRUE. I'M MIKE TAMIR. AND THAT'S EXACTLY WHAT I'M HERE TO TALK ABOUT. FAKE NEWS.
MIKE TAMIR
MACHINE LEARNING SPECIALIST
DATA SCIENCE FACULTY—UC BERKELEY
THESE DAYS, THE INTERNET IS OUR NUMBER ONE GATEWAY TO THE NEWS.
• FUNDING BILL STUCK IN COMMITTEE
• NEW SHOPPING MALL OPENS
• LOCAL TEAM WINS HOCKEY TOURNAMENT


BUT THERE'S A LOT OUT THERE...AND ALL "NEWS" ISN'T CREATED EQUAL. IT'S GETTING HARD TO TELL WHAT'S REAL JOURNALISM AND WHAT ISN'T.
• McCoy Defeats Piper in Landslide Election
• War Rages On
• Puppy Saves Kitten from Tree
• Epic Skydiving Fails (#10 is CRAZY)
• Celebrity Voting Tips
• High Fashion on the Red Carpet
• Another Royal Wedding
• Actor's Extracurricular Antics Exposed
IT'S A PROBLEM THAT MAJOR ONLINE PLAYERS LIKE SOCIAL MEDIA SITES AND SEARCH ENGINE COMPANIES ARE TRYING TO SOLVE.
IT'S BEEN CHALLENGING.
THE SHEER VOLUME OF INFORMATION MAKES IT IMPOSSIBLE TO ANALYZE EVERYTHING AND DETERMINE WHETHER IT'S TRUE OR FALSE.
LUCKILY, THERE'S ANOTHER WAY TO SPOT FAKE NEWS.
OFTEN, FAKE NEWS ISN'T TRYING TO SHARE INFORMATION. IT'S TRYING TO INFLUENCE AND MANIPULATE US.
WHEN HUMANS ARE CONFRONTED WITH CERTAIN EMOTIONAL TRIGGERS—LIKE FEAR—WE REACT INSTINCTIVELY. THIS SUPPRESSES OUR ABILITY TO THINK CLEARLY AND RATIONALLY.
Is That a Bear in Your Closet? The Answer Might Shock You!


IN PREHISTORIC TIMES, THIS WAS A GOOD THING.
LET'S SAY TWO CAVEMEN SEE A SHADOW THAT IS VAGUELY BEAR-SHAPED.
ONE OF THEM DECIDES TO APPROACH THE SITUATION RATIONALLY...
THAT SHADOW *MIGHT* BE A BEAR. BUT, BEFORE I JUMP TO CONCLUSIONS, I'M GOING TO WEIGH ALL OF THE POSSIBILITIES...
...WHILE HIS FRIEND CHOOSES A DIFFERENT COURSE OF ACTION.
LIVING IN A DANGEROUS WORLD TAUGHT OUR ANCESTORS THAT, SOMETIMES, IT'S SAFER NOT TO STOP AND THINK EVERYTHING THROUGH.


IN THE MODERN WORLD, SITUATIONS LIKE THIS ARE FAR LESS COMMON.
BUT THE INSTINCT TO REACT INSTEAD OF THINK IS STILL THERE. FAKE NEWS IS DESIGNED TO TRIGGER IT.
Is That a Bear in Your Closet? The Answer Might Shock You!
AND THAT'S OUR KEY TO DETECTING FAKE NEWS.
WE CAN'T DETECT TRUTH---BUT, USING AI, NATURAL LANGUAGE PROCESSING, AND DEEP LEARNING, WE CAN DETECT INTENT.
'WE STARTED BY FEEDING TEXT TO "WALT," AN AI ALGORITHM WE CREATED, UNTIL IT COULD REPRESENT THAT TEXT MATHEMATICALLY.
BASICALLY, WE TAUGHT IT TO READ.
WALT BEGAN TO LEARN THE RELATIONSHIPS BETWEEN OUR WORDS. FOR INSTANCE, IT COULD USE THE MATH TO COMPLETE ANALOGIES!
KING IS TO QUEEN AS MAN IS TO WOMAN
LONDON IS TO ENGLAND AS PARIS IS TO FRANCE
GREEN IS TO GO AS RED IS TO STOP
NORTH IS TO SOUTH AS EAST IS TO WEST
BUT THAT WAS JUST THE BEGINNING: BY USING "DEEP NEURAL NETWORKS" WE WERE ABLE TO TEACH WALT TO PROCESS THESE WORDS IN ORDER AND SO IT COULD MATHEMATICALLY ENCODE THE MEANING OF ENTIRE SENTENCES AND PARAGRAPHS.


WE USED THE ALGORITHM TO CREATE A WEBSITE—FAKERFACT.ORG—THAT CAN "READ" AN ARTICLE AND DETERMINE WHETHER ITS INTENT IS TO CONVEY FACTS...
Governor Loses Election
Analysis: Walt Says This Sounds Like Journalism
...OR TO PROVOKE EMOTIONS.
Is That a Bear in Your Closet? The Answer Might Shock You!
Analysis: Walt Says This Sounds Like Bear Manipulation.
IT GIVES USERS A PRETTY ACCURATE TOOL TO FIGURE OUT IF A STORY IS TRYING TO MANIPULATE THEM.
AND, BY USING A PHENOMENON CALLED WISDOM OF THE CROWDS, WE CAN IMPROVE WALT'S ACCURACY EVEN FURTHER.
THERE'S AN INTERESTING STATISTICAL PHENOMENON WHERE, IF A LARGE GROUP IS SURVEYED, THE AVERAGE OF THEIR ANSWERS IS REMARKABLY ACCURATE.
WHEN GUESSING THE NUMBER OF JELLYBEANS IN A JAR, FOR EXAMPLE, ALMOST EVERYONE OVER OR UNDERESTIMATES...
675
325
260
BUT—AS LONG AS THEY DON'T COMPARE ANSWERS...
... THE AVERAGE OF THE RESPONSES IS TYPICALLY REMARKABLY CLOSE TO THE ACTUAL NUMBER.
500
Average Answer: 488
Actual Answer: 490


WE USE WISDOM OF THE CROWDS WITH FAKERFACT TOO. USERS CAN GIVE WALT FEEDBACK ON WHAT THEY CHECK, LIKE IF THEY THINK IT SOUNDS LIKE JOURNALISM OR NOT.
Is That a Bear in Your Closet? The Answer Might Shock You!
AFTER SOME STATISTICAL ADJUSTMENTS, THE "WALT" ALGORITHM CONTINUES TO LEARN FROM USER RATINGS TOO, SO IT GETS MORE AND MORE ACCURATE THE MORE PEOPLE USE IT!
IT'S IMPORTANT TO KNOW WHEN WHAT WE READ IS TRYING TO MANIPULATE US.
WE MIGHT NOT HAVE A FOOLPROOF WAY TO KNOW WHAT'S "TRUE" AND "FALSE," BUT MACHINE LEARNING CAN AT LEAST SHED ENOUGH LIGHT ON THE SITUATION---
Is That a Bear in Your Closet? The Answer Might Shock You!
YEAH... I DIDN'T THINK SO.
---TO MAKE SURE WE SPEND LESS OF OUR TIME RUNNING AWAY FROM BEARS THAT AREN'T THERE.