

AI BUZZ

- Science goes through constant and continuous knowledge creation.
- Fields like AI have charged and rapid research growth.
- Can we untangle *AI boom* and *AI winters* in research?
- We present methods that could map the evolution of fields and evaluate how fields respond to new ideas.
- ADVANTAGES**
 - Funding agencies would find this useful to allocate funds to growing topics.
 - Researchers to capture the pulse of the field or avoid 'buzzy' terms.

CAN WE IDENTIFY AND QUANTIFY TRENDING TOPICS IN SCIENCE?

WHY KEYWORDS?

- SIMPLEST INDICATION OF CONTRIBUTION(S) OF RESEARCH TO THE FIELD.
- EASY TO RETRIEVE INFORMATION
- PROXY FOR KNOWLEDGE CREATION
- PROVIDE CLUES FOR MOVEMENT OF IDEAS
- CAN TRACK HOT TERMS LIKE 'BIG DATA'

FUN FACT:

ONLY 8.85% OF KEYWORDS MAKE IT TO MORE THAN 4 RESEARCH PAPERS IN AI!

SHIFT IN FOCUS OF AI RESEARCH

NEUROSCIENCE --> COMPUTATIONAL OPTIMIZATION

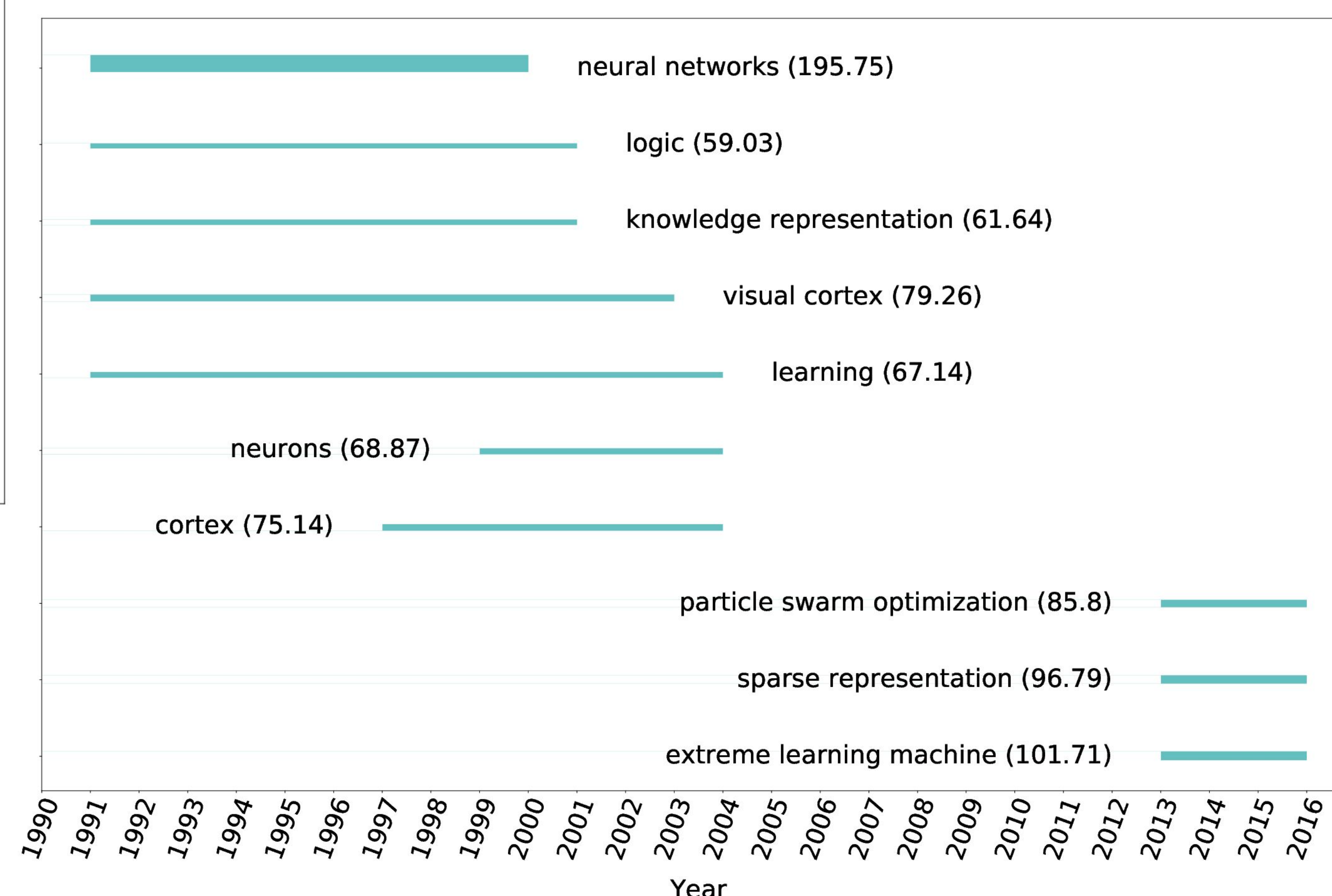


FIG 2: KEYWORD BURSTS DESCRIBE THEMATIC BURSTS

METHODS

- HOW LONG DOES A NEW KEYWORD SURVIVE?
 - KAPLAN-MEIER SURVIVAL ESTIMATOR
 - For each interval, we calculate the number of survived keywords/ number of keywords
 - We can **calculate the cumulative probabilities over time** to estimate survival.
- BURSTINESS ANALYSIS:
 - KLEINBERG'S BURST DETECTION METHOD
 - Creates a tree of increase/decrease in proportion of papers that used a certain keyword over time.
 - The resultant burst weight provides a metric for **strength of influence** of that keyword in that 'bursty' time frame.

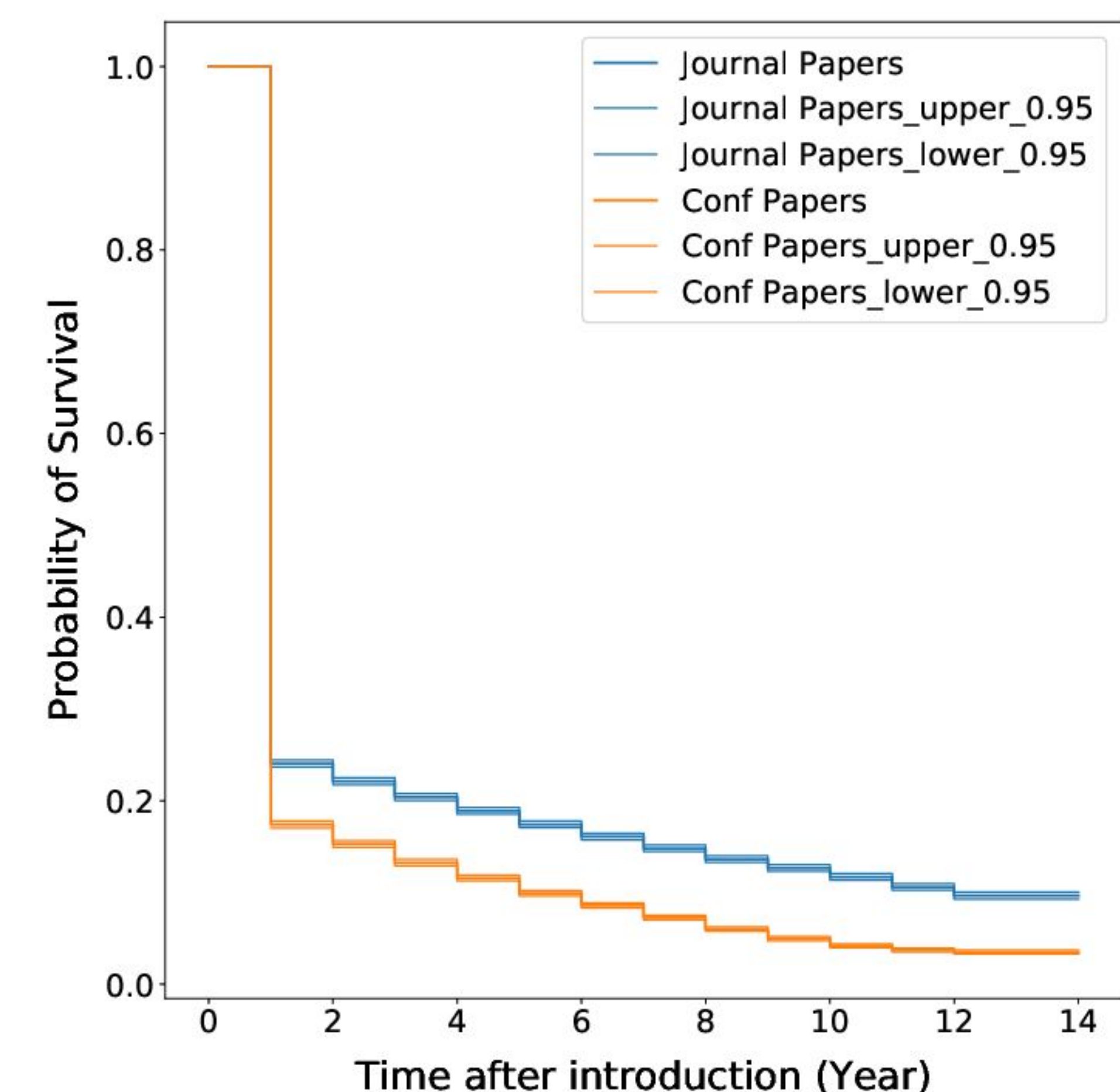


FIG 3

- ABOUT 80% OF THE KEYWORDS DON'T SURVIVE PAST YEAR 0
- CONFERENCE AND JOURNAL KEYWORDS HAVE DIFFERENT SURVIVAL RATES

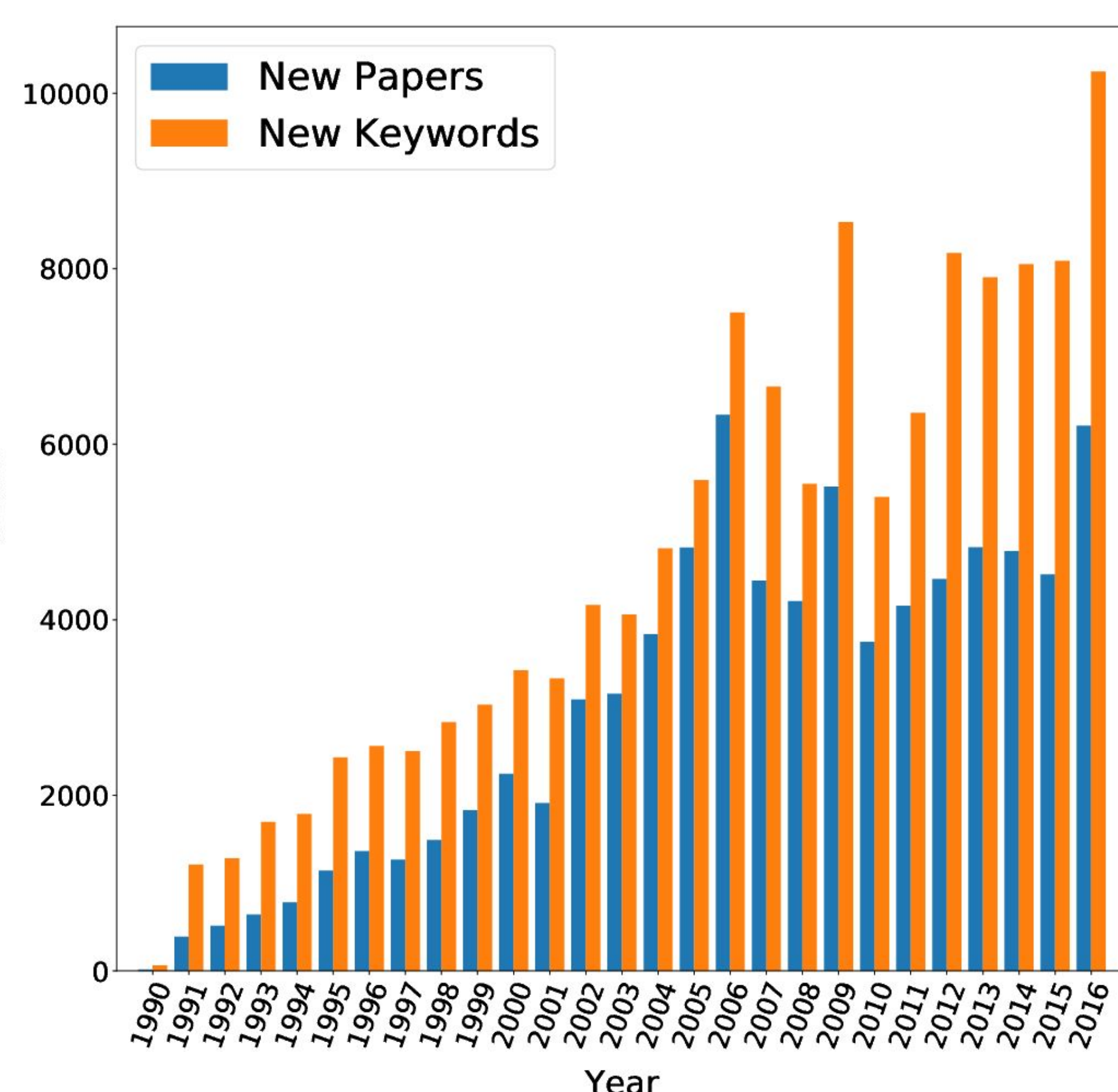


FIG 1

- TRACES OF *AI WINTER* WITH PEAKS OF NEW KEYWORDS IN 2006, 2008 AND 2012
- CONTINUOUS PRODUCTION OF NEW KEYWORDS