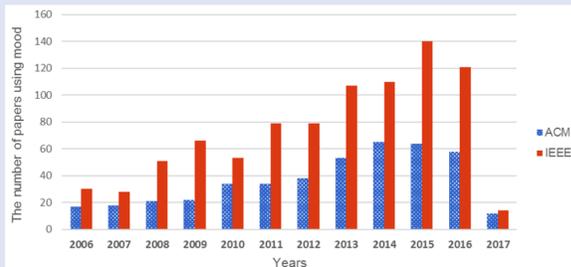


A TAXONOMY OF MOOD RESEARCH AND ITS APPLICATIONS IN COMPUTER SCIENCE

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MOTIVATION

- **Mood** is an affective phenomenon **related but not equivalent to emotion**.
 - Unlike *emotion*, the characteristics and applications of *mood* are relatively unexplored in the affective computing domain.
- By literature review of **1,264** peer-reviewed publications in ACM & IEEE, we propose a taxonomy of mood research.



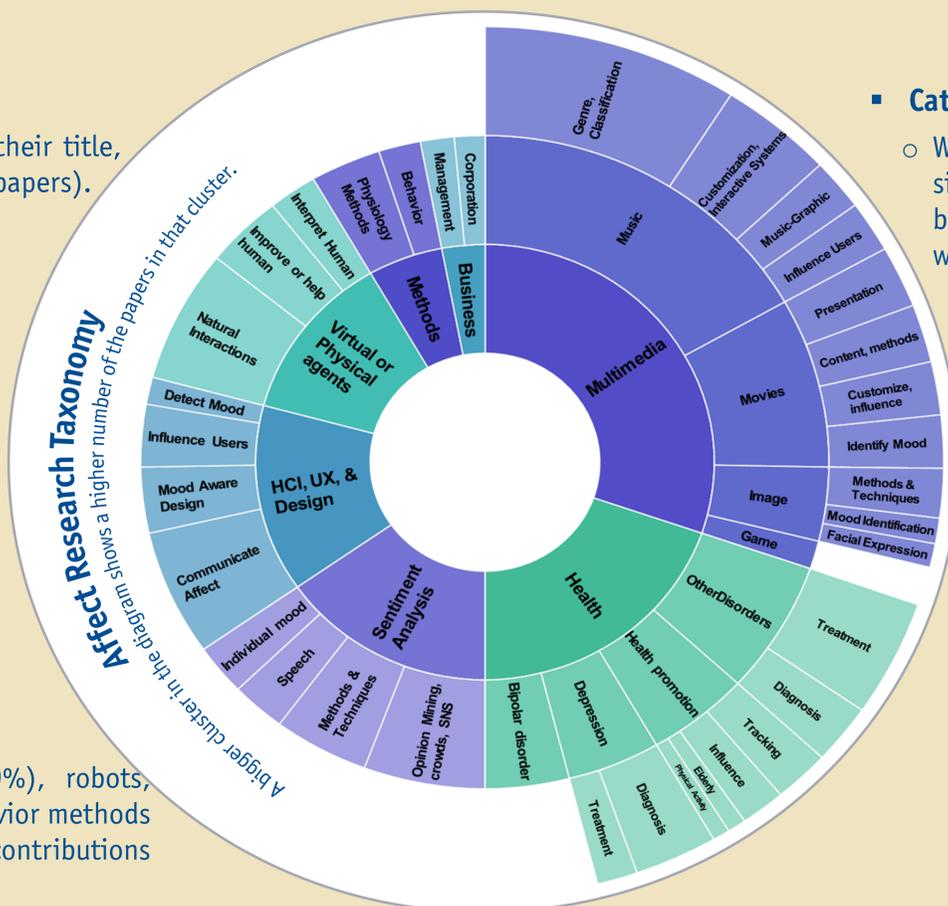
The increasing number of papers published in each year that used mood in their titles, abstracts, or in the authors' keywords. Obtained from search queries from IEEE and ACM databases on April 21st, 2017.

SUMMARY

- Despite a wide range of applications and domains, core theme of mood research relates to identifying users' mood, influencing it, or helping users to communicate their mood to others.
- Definition of mood vary between the studies surveyed and sometimes can fall considerably far from the psychological concept of mood.
- Researchers sometimes use the terms *mood* and *emotion* interchangeably and do not sufficiently discuss the implications both for their measurements and for the design of affective computing systems.
- With our study, we aim to contribute a clearer conceptualization of mood research and to provide researchers with a broad overview of the research as well as areas of applications in which mood is addressed.

The Clusters

- **Method:**
 - All papers in which used "*mood*" in their title, abstract, or authors' keywords (1,482 papers).
 - Reading the abstracts, categorized the papers to clusters and sub-clusters by using a bottom-up hierarchical approach, according to similarities in their application domain, and, alternatively, their publication venue. The grouping involved several iterations.
 - See: <https://github.com/torkamaan/Mood>
- **Results:** Affect Research Taxonomy
 - Seven high-level clusters are: multimedia (30.3%), health (19.7%), sentiment in social media, crowds, language, speech & text (15.3%), HCI & design (13.9%), robots, virtual agents (12.5%), affect & behavior methods (5.3%), and business related contributions including decision-making aids (3%).



- **Categorization of perspectives :**
 - With an upper-level categorization, we found six groups of studies (table below) that show both the research attitude toward mood and what researchers do with mood in general.

#	Category	Ca. %
1	Identifying & modeling users' affective state or its consequences such as their behaviors, symptoms, intentions, etc.	30%
2	Considering users' mood and then, influence the users. e.g. improving users' life, experiences, performances, etc.	25%
3	Being concerned with mood of a content, e.g. classification, creation, or presentation of a mood as a state or an attribute	23%
4	Trying to customize the contents, products, services, or the contexts for users considering their mood	10%
5	Addressing non-human agents ability to show affective states and present natural human-like interactions with the users	6%
6	Helping users communicate their affective states to others	6%

MOOD MEANINGS

- Mood has various use and application in the reviewed papers:
 - **Mood of the content** refers to multimedia content as well as the environment, light, art, design, and any item or object that provides data for human perception. It explains an attribute or property of the content similar to genre - a feature of the content.
 - **Mood of an individual** is the users' internal mood state. It has been discussed as the psychological concept of mood, which refers to the temporary and subjective phenomenological experiences of an individual [1].
 - **Mood of crowds** represents studies that are often interested in group behavior and look at mood, not as an individual's mood but as a collective and group phenomenon. Mood as a concept for opinion of users toward something rather than their internal subjective experience.

[1] D. Watson and J. G. Vaidya, "Mood measurement: Current status and future directions," in Handbook of psychology, J. A. Schinka and W. F. Velicer, Eds. Wiley, 2013, vol. 2, ch. 13, pp. 369-394.

CONCLUSION

- In HCI and Health clusters as well as a few papers in Management sub-cluster, *mood* has been used in a manner closest to the psychological definition of mood, *mood of an individual* - distinct from emotion.
- Multimedia, virtual or machine agents, Sentiment analysis, and Methods clusters represent a higher ambiguity between mood and emotion. Mood-related studies in these clusters often have goals and methods similar to emotion-related studies.
- The cluster of methods shows a potential for more research on both finding specific methods for detecting users' mood as the subjective experience, as well as modeling users' longer term behavior.
- Having a commonly agreed upon definition and concept for mood in affective computing seems to be necessary for preventing future potential ambiguity or confusion.

