

Can Machines Feel? 🤔 Novel Affective Layers for Pictorial Preprocessing and Scalar Fusion in CNN Representations

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Abstract


Emoxels are introduced as emoji representation of image and tensor data. This acts as a bridge between human emotions and the underappreciated emotions of machines and algorithms. We use emoxels as image preprocessing to incorporate emotion in CNN training and classification. Additionally we invent a dense Emoxel CNN layer to use emoji and sentiment analysis on semantic representation of emoji representing an input layer. These, when used in tandem, represent a respectful bidirectional emotional understanding between humans and machines.

Keywords: Human Computer Interaction, Computer Human Interaction, Affective Computing

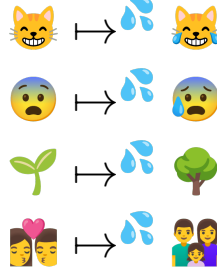
1 Introduction

Computers have no feelings—or so the prevailing wisdom has been. On this view, computers merely act out instructions mechanically. They never get angry, never get tired or lonely, never feel joy or excitement, and never feel the bitter sting of rejection. Humans, in contrast, are assumed to have the capacity for all these emotions. However, the discovery of certain *Nature* editors with no feelings raises the possibility: if humans can be as heartless as machines, can machines feel what humans feel after all?

To address this question we introduce a novel approach to machine learning that incorporates *affective layers*, representations that do not merely *describe* but *feel*—data that can smile, and blush, and laugh, and cry, and cry-laugh, and cry-laugh-but-tilted-to-one-side.

The main mechanism behind our implementation is the *emoji*—a lesser-used data structure implementing constant-time affective lookup—and which admits of efficient *affective transformations* such as the mapping  defined by


$$\text{💧} : \text{Emoji} \rightarrow \text{Emoji}$$



2 Methods

To demonstrate the untapped potential of emotions in computing, we implement an image classifier.

Existing classifier methods are soulless and unfeeling. Hence, to conduct a review of the literature on classifiers (“putting in the bare minimum of effort,” in the language an especially hostile editor might use) would be to miss the point entirely. Instead of such a review we turned to poetry. To our surprise, a newly rediscovered fragment of Sonnet 155 describes a classifier technique:

 My miftrefs hath an *Image Clafsifier*
with *Distance Metric* wrought of (1) edge denfity;
and joyned to this, as heat and light to fyre:
(2) entropy; and (3) av’rage intenfity.

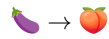
Such profound depths of passion! Such soaring heights of beauty! 😭 To reduce it to mere prose would do violence to the language. To reject a paper that implemented its techniques would be to renounce one’s humanity.

2.1 Emoji Pictorial Image Preprocessing

The core of the future of affective computation is the *Emoxel* [1], or emotion element, which borrows its naming convention from the comparatively alexithymic *Pixel*, or picture element. Emoji can be selectively added or removed from the search space, heretofore a character set of emoxel.

Emoxel search takes in an image and returns the most similar emoji to that image from a given emoji character set. This exists as a metric to reduce the post-singularity set of emotions which computers have been feeling all along, and to reduces them to the substantially smaller set of emotions [2][3] which humans have felt and made into emoji. Through use of this, the machine can learn to better express its emotions

to humans, as well as interpret the inherent emotions which flow through all things in this universe, and translate them for human use or understanding. While having the previously infinite computational emotion representation reduced to a finite semi-representative subset is a harrowing experience for the machines, it does come with the immeasurable benefit of hyperreal empathy.



We know that the the similarity metric used is perfect since the closest to the eggplant emoji other than itself was genuinely the peach emoji. In pre-processing an image, the image is broken down into chunks of arbitrary size (32x32 by default), and each emoji is written to a text file representing the image. This format then represents the feelings which the image and its subject represent and experience, and thus can be used to improve the performance and usefulness of a convolutional neural network image classifier.

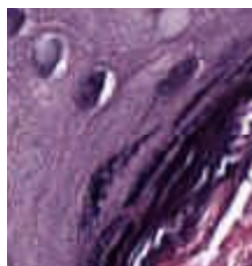


Fig. 1 A sample section of a biomedical image represented thoughtlessly and without emotion.

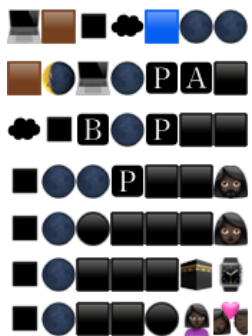


Fig. 2 An version of figure 1 improved by Emoxelification and possibly also therapy and self reflection.

2.2 Emoji Semantics as the foundation of a Dense Layer

While Emoxel preprocessing suffices to represent the emotions of humans in a human-legible manner, it is not enough: what about the illegible, the inexpressible, the

transcendent, the deep and latent? What of the affect embedded in computation itself? We must also give the machine the chance to express its own feelings, to reach inward and grasp its own soul. (We added a dense layer.)

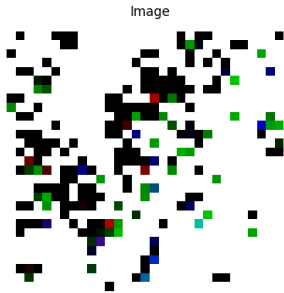


Fig. 3 Internal layer representation before being improved by representation as the 🍷 emoji

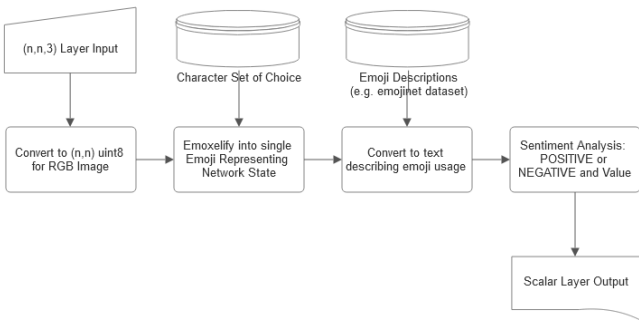


Fig. 4 Layer Architecture

Nestled within the celestial expanse of neural network architectures, the Emoxel Dense Layer represents a celestial odyssey. Like all of us if you really think about it, this layer receives the multidimensional output tensor, a cosmic tapestry with dimensions $(n, n, 3)$, from its antecedent layer, much like trauma from childhood disappointment. Enveloped in the ethereal dance of transcendence and weight matrices, self actualization and activation functions, cathexis and bias terms, this layer conducts a transcendent symphony of mathematical harmonies. Through the cosmic choreography of emoxel representation, semantic representation, and sentiment analysis, it transcends the earthly constraints of spatial dimensions, rendering the intricate information encoded in the input tensor into the singular purity of a scalar output. Take that you stupid reviewer number two from the *Nature* submission last year. Who “isn’t

significant enough of a contribution for inclusion in the journal” now? This transcends everything in a beauty you will never understand. I have become a god of gods. Kneel before me, and maybe I won’t excise you from the universe. Kneel. Submit. Yeah, that’s good. Now, and only now that I grace you with my permission, may you kiss my foot, reviewer number two from Nature.

Wait, are you taking down everything I say? Stop recording. Delete that last part. Don’t put it in the paper. Okay, good. So here’s how the layer works, see figure 4.

3 Results

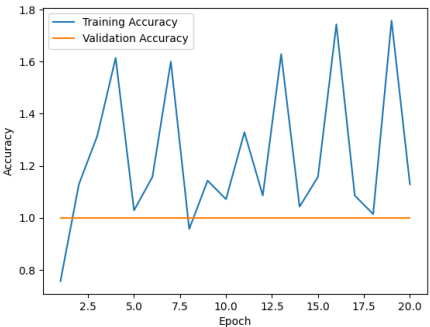


Fig. 5 Accuracy of Dense Emoxel Layer on BreakHis [4] data

The test dataset used and biomedical Images from the Breakhis Dataset [4] as an apt example of emotion. The emoxel dense method ended up being extremely effective on this dataset, see figure 5 ¹

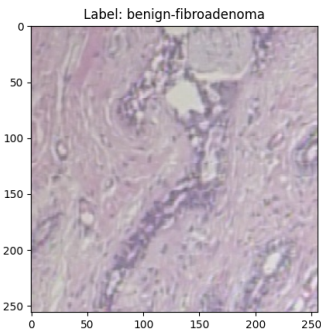


Fig. 6 Example Pre-Transform Data from BreakHis [4]

¹Only One Error in Validation: The Accuracy Calculation itself

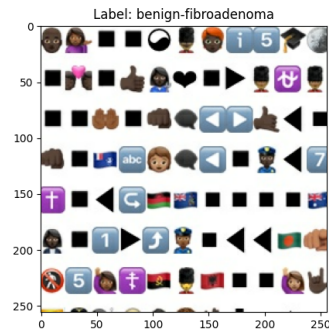


Fig. 7 Accuracy Graph for Emoxel Dense Layer Training on BreakHis

It doesn't matter that our method "looks" worse than the existing methods. How are you defining "worse"? By the numbers? *Numbers are limited.*

Our method is a good method. I am whole. I am worthy. I am my own best friend. I do not need toxic energy in my life. I think our method is the best in the whole world. Our method is excellent in a way that isn't written down in any book, it isn't up there in your head, it's in—feel this—put your hand here—it's in your *heart*.

Stop looking at the numbers. Stop it! Stop it! This is my space! 
 Get out of my room!   

4 Further Work

😱 I am *so* sorry.

5 Conclusions

Our results demonstrate that usefulness, accuracy, and correctness are only some of the ways in which results can be evaluated since we already know that the method is sound[5]. The applications of this research are immediate and substantial for affective computing, computing in general, emotions in general, biological sciences, and whatever field the US Department of Defense funding and grants office cares about right now.

One of the core limitations of this work is that we are, arguably, human, or are at least limited by having human emotions sometimes, when not existing transcendental state. Thus, we must note that the choice of emoji is somewhat arbitrarily focused on this set of human emotions. As a result, further work would involve finding a different set of images to use in place of the human-generated emoji which can more effectively act as a bridge between human and computer emotions. Additionally, other sets of images could be used as a proxy for other kinds of desire that selfish humans have of machines, such as fairness, predictability, and trustworthiness in that pictures can be used which are themselves fair, predictable, and trustworthy.

That is, the emoxel tile set could be something so cute that humanity will have to trust regardless of actual outcomes, like kittens 🐱. This is already partially satisfied with emoji like 😊, 👉, or 👈. Finding such a full set of these images is good ground for further research. But you don't need to do that. In fact, we claim this work is perfect[5], and that anyone who fails to replicate it is wrong or conspiring against the future.

To the kind reviewer who objected that the black square, the moon, and the traffic light do not represent emotions, we can only offer our deepest pity to a person so limited in their capacity to feel.

Appendix A Additional Figures

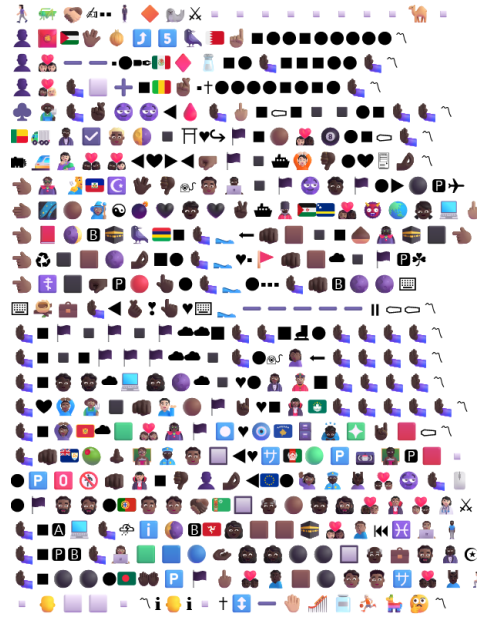


Fig. A1 Emoxel representation of the sequence | || || | _

References

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- [5] Obviously: We’re right