



Figure 1: Example of auto-generated family ads in a few of the IAB standard sizes.

YourAd: A User Aligned, Personal Advertising System

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ABSTRACT

Advertisers have optimized the periphery of our attention to drive complex purchasing behavior, typically using persuasive or rhetorical techniques to promote decisions that are agnostic to our best interest. Instead of serving the ambition of companies with large marketing budgets, what if these techniques were used to reinforce the behaviors and attachments we choose for ourselves? YourAd is an open-source browser extension and design tool that allows users to supplant their internet ads with custom replacements—designed by and for themselves. YourAd incorporates industry best practices into a platform to facilitate experimentation with user-aligned advertisement ecosystems, probe the limits of their influence, and optimize their design in support of an end user’s personal aspiration.

KEYWORDS

Display Advertising; Attention Aware Interfaces; Peripheral Attention Interaction; Choice Architecture; Behavioral Intervention

INTRODUCTION

The average person is exposed to 200-400 display ads every day, ~150 of which are consciously processed. [9] These ads can be successful in one of two ways— in eliciting a behavior, measured

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Figure 2: Example of auto-generated sugar ads in a few of the IAB standard sizes.

easily by Click Through Rate (CTR), or in creating brand awareness/affinity, measured through brand recall. Most of the accumulated influence of these micro-interactions on our decision-making can be attributed to simple cognitive biases due to the limitations of the format.

This persuasive style has left over 70% of consumers skeptical that advertisers are trying to influence them to purchase products they don't need. As a result, a large part of advertising over the last twenty years has included Persuasion Knowledge Modeling– anticipating consumer resistance to various persuasion techniques and accounting for or disarming them. [7] Our ability to recognize overt manipulation has pushed modern advertising towards subtle, integrated strategies like branded content, product placement, and viral marketing.

What if those hundreds of daily micro-interactions were used to bias us towards the decisions we want to be making in the first place? What if advertisers weren't fighting consumer skepticism and resistance? YourAd aims to answer these questions.

YourAd is an open source tool to use the principles of good advertising for reinforcing personal goals. It distills best practice into a simple, programmatic ad creation tool; users can design and create personal ads, completely replace their browser ads with them, and track ad success and scheduling based on CTR (where clicks imply a successful intervention).

Three important changes occur with YourAd compared to traditional advertising: (1) since ads are explicitly aligned with user goals, we significantly reduce the consumer defensiveness that dictates modern marketing strategy, opening the door for new advertising techniques, (2) personal ads can incorporate personal images, which may make a powerful difference in their efficacy, and (3) users can be involved in their own ad creation process, changing their framing of all future ad encounters. YourAd provides a platform to experiment with these differences, probe the limits of advertising's effect on our judgment and behavior, and optimize a user's advertising ecosystem to support them in achieving their goals.

WHAT MAKES ADVERTISING WORK?

One principle of advertising is the **mere exposure effect**, (similar to the **illusion of truth effect**), which is the tendency of familiar things to be viewed as truthful or favorable. Our decisions are biased towards brands we recall, either from repeated exposure or memorable and unusual content (the **bizarreness effect**). [6]

A second principle is our tendency to overvalue a small subset of available, easily comparable information when faced with complex decisions. Many common cognitive biases– including **anchoring bias**, the **availability heuristic**, and the **decoy effect** – describe this phenomena. One easily recallable statement can have a dramatic impact on our decisions. Negative ad campaigns are especially effective in this regard (due to **negativity bias**); we can co-opt 'attack campaign' techniques to bias ourselves away from certain behaviors or judgments. [12]

Ads also shape our emotional responses to a given brand. This is accomplished in myriad ways, including social techniques like **identity priming**, **authority bias** or **physical attractiveness stereotype**, as well as with simple **pairing/association** which take advantage of **attribution bias**. We can exploit appeals to identity, authority, and positive/negative pairings in YourAd to help shape our own view of certain products and behaviors.

Display Ads

Empirical data significantly informs most aspects of display ad design, including size, location, layout, font, persuasive technique, etc. [10] The efficacy of rational vs. emotional content varies depending on user behavior (whether they're goal oriented vs. surfing), so both types are useful. [13] Colors should not be too bright, because consumers have learned to ignore ad-like objects in their periphery; longer marketing copy also (counter-intuitively) tends to work better. [11]

Ad scheduling appears to be optimal on an exponential scale that mirrors patterns of human memory [14]. Interestingly, people habituate to ads ('perceptual fluency'), and studies show slight changes in logo position and variability in ad type (i.e. text, image, video) can improve outcomes in repeated contexts. [8, 15]

YOURAD: PUTTING ADS TO WORK FOR YOU

YourAd is an open-source tool to allow individuals to design their own ads for themselves, inserts them over all existing ads in their browser, and gives users basic tools to track their timing and efficacy. It aims to (1) distill the best practices and psychological techniques honed by the advertising industry into a simple design tool, (2) explore new extensions for ads that are user-aligned and user-driven, and (3) parameterize advertisement creation and scheduling so they can be programmatically optimized for each individual. You can follow the project on github.com/mitmedialab/yourad.

Ad Design

YourAd begins with the command-line ad design tool shown in Figure 4, which programmatically generates text-only ads, image-only ads, combination ads, or 'paired' (two image) ads in line with best practices. All ads are assigned a cohesive 'campaign slogan' and are generated in the ten most common International Advertising Bureau (IAB) standard sizes– with small variations in logo placement to increase engagement. Ads are auto-indexed in a JSON file with metadata about the ad cadence and 'successful click-through' messaging for use in the browser.

Ads use sensible, randomized defaults for colors and fonts, and will automatically extract a relevant color palette for image-based ads. Colors, fonts, and marketing copy can also be explicitly set in the tool alongside research-backed advice.



Figure 3: Example of auto-generated pair ads, where 'promoted' things are paired with surprising happy photos, and negative things are paired with the opposite.

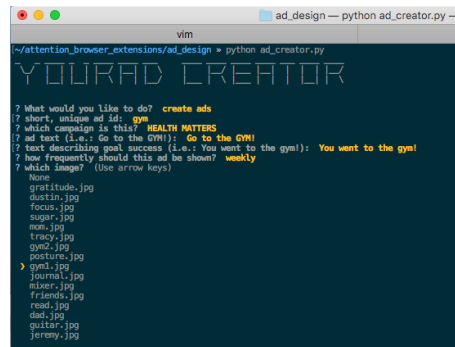


Figure 4: Commandline tool for ad creation.

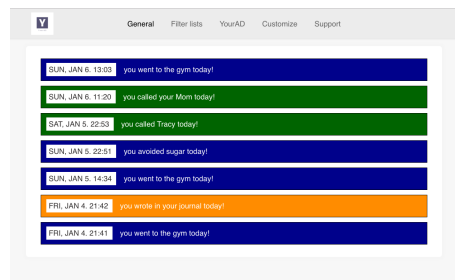


Figure 5: Basic tracking page for intervention success based on ad click-through.

Standard text and image ads can use exposure to elevate important concepts or behaviors that fall below our main priorities– including concepts that require frequent micro-interventions (i.e. good posture, balanced priorities, or a re-framing of outlook) as well as tasks that are too infrequent for habit formation (checking in with acquaintances, scheduling dentist appointments, or surprise gifts for a loved one).

These ads also work as traditional advertisements, but uncoupled from corporate interest. We can advertise products we already own and would like to use more (a book or game we’ve purchased), as well as new brands that objectively align with consumer values we hold (i.e. sustainability).

The YourAd ‘pairing’ designs associate a set of random high or low valence images ([puppies, babies, ...] or [skulls, death, ...]) with a provided concept to help shape our emotional response over time (see Figure 3.) While normally this blatant attempt at persuasion would be met with skepticism, it’s user-alignment in this case should reduce psychological reactance. Emotional ads– including ‘attack ads’– can also be designed using standard ad formats through marketing copy and image selection to improve our framing of places like the gym, behaviors like smoking, and health foods like broccoli.

For maximum effect, each of these ads can be combined with powerful behavioral techniques like contracts (‘I will avoid sugar for the rest of the day, [click here]’) or identity priming (‘You are strong. You are a fighter. That’s why you commit to workout. Are you going to work out today?’).

Ad Replacement

Prior work in the ad replacement space includes ‘Vintage Ads Are Cool’, *Addendum*, *Intently*, *AdReplacer*, and *Catblock* which replace current ads with vintage ads, art, inspirational quotes, news headlines, and pictures of cats. [1–5] The last of these– *Catblock*– is an open-source fork of *Adblock Plus*, one of the most popular adblocking extensions, which has been developed and maintained by two of the original *Adblock* team members. It runs in all three major browsers. For this project, we forked the the Chrome version of the *Catblock* project.

Ad Interaction

Clicking an advertisement records its ‘successful completion’ and takes the user to a web page that tracks a full history of completed tasks, as in Figure 5, intended to gamify task completion. Ad clicks also deactivate the ad for the period of time set by the user during the initial ad creation– for example, if the ad is to ‘call an old friend’ once a month, clicking the ad will log the event (‘You called an old friend today!’) and hide the ad until it is time to repeat the behavior a month later.

FUTURE WORK

The next step for the YourAd project is a pilot to measure its impact through surveys, the CTR system, and external measures (like call logs or work output when possible). We will also examine the efficacy

of (1) overt– but user-aligned– persuasion attempts (like the pairing ads), (2) personal ad imagery (i.e. a generic image of a book you have vs. a picture of *your* copy taken on *your* counter), and (3) user-driven ad design (the ad creation process frames future ad interaction vs. similar ads that preserve surprise and authoritative distance).

Other interesting explorations we are considering include:

- **Extended Gamification**– The click-through tracking screen should be built out to include best practices for continued engagement, including points, streaks, charts/graphs, scoreboards, or even text reminders to encourage behavior.
- **Social Advertisements**– The incorporation of peer influence and peer competition in dynamic ads (i.e. Your friends Mark and Ally are doing it! Your friend just accomplished this goal today! Jack has gone the gym 2 more times than you this week!)
- **To-Do List Front-End**– Instead of an explicit ad design/curation step, YourAd could hook into pre-existing task tracking tools, and generate ads and alter ad presentation based on list priorities and task completion.
- **Optimized Ad Scheduling**– Ads that are associated with goals that are being neglected too frequently could increase in probability or completely take over all ad slots as a pressing reminder.
- **Narrative Behavioral Interventions**– Some powerful behavioral interventions could involve serial, escalating interaction design– for instance clicking on a less committal ad that says ‘Click here if your Dad deserves a call from you’ might follow up by a slightly more involved ad like ‘Your Dad has given you so much’ with a Button that says ‘I’m going to be grateful and call my Dad.’
- **Causal Models for Ad Personalization**– All of the above, including the programmatic control of our ad creation tool, give us parametric control over ad design, frequency, structure, content, and strategy. Combined with a measure of ad influence and success (like CTR), we have a complete system to causally explore ad optimization for each individual.
- **Market-based Interventions**– YourAd could potentially support a two-sided market, in which users pay professional marketers to design ad campaigns tailored to their goals. Advertiser quality is measurable based on sustained/repeated behavioral outcomes in a given sub-population.
- **Friend Ad Creation**– An engaging extension of this work could be to give design and control of your ads to selected friends and relatives (and vice versa), alongside other ad sharing features.



Figure 6: Ads inserted into NYTimes and Facebook through the Chrome Browser using YourAd.

CONCLUSION

The advertising industry is the home of a very interesting type of technology– effective, high-volume micro-interactions that capitalize on our peripheral attention. The impact of the thousands of brand

exposures we encounter every day is not easy to quantify, but the size of the marketing industry belies its impact on our cognition and our behavior.

YourAd unlocks principles of peripheral engagement traditionally used to bias our behaviors and judgments for our own enrichment. It is a platform to explore a new type of marketing– transparent, aspirational, personal, and completely aligned with the self-determined best-interest of its user.

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