AdSmart Advertisement

Presentation of AB test analysis

(Data Experimentation Capstone 1)

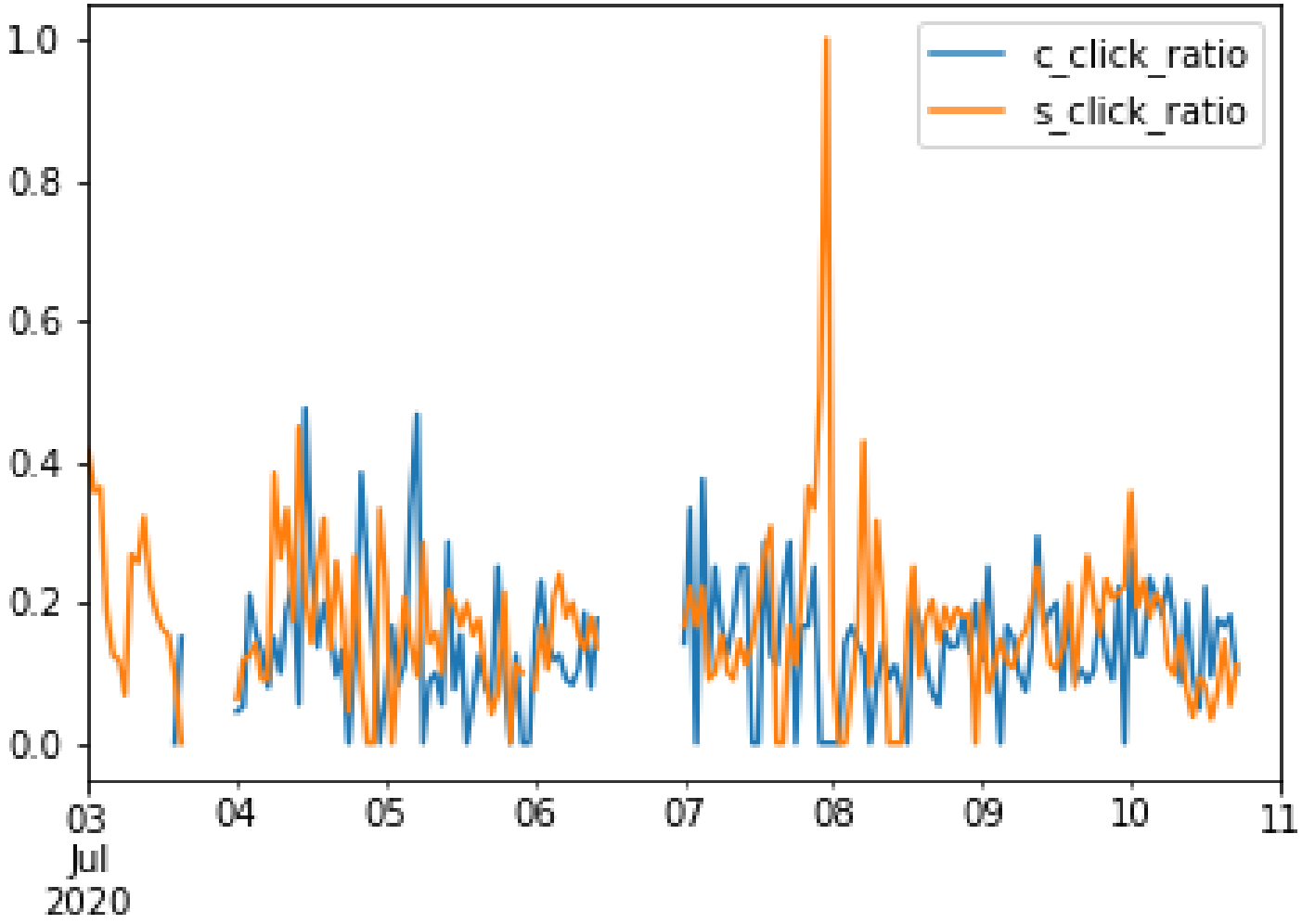
By Jared Sutton

Breakdown of raw data:

	Did not click	Clicked “no”	Clicked “yes”
Control	3485	322	264
Exposed	3349	349	308
Total	6834	671	572

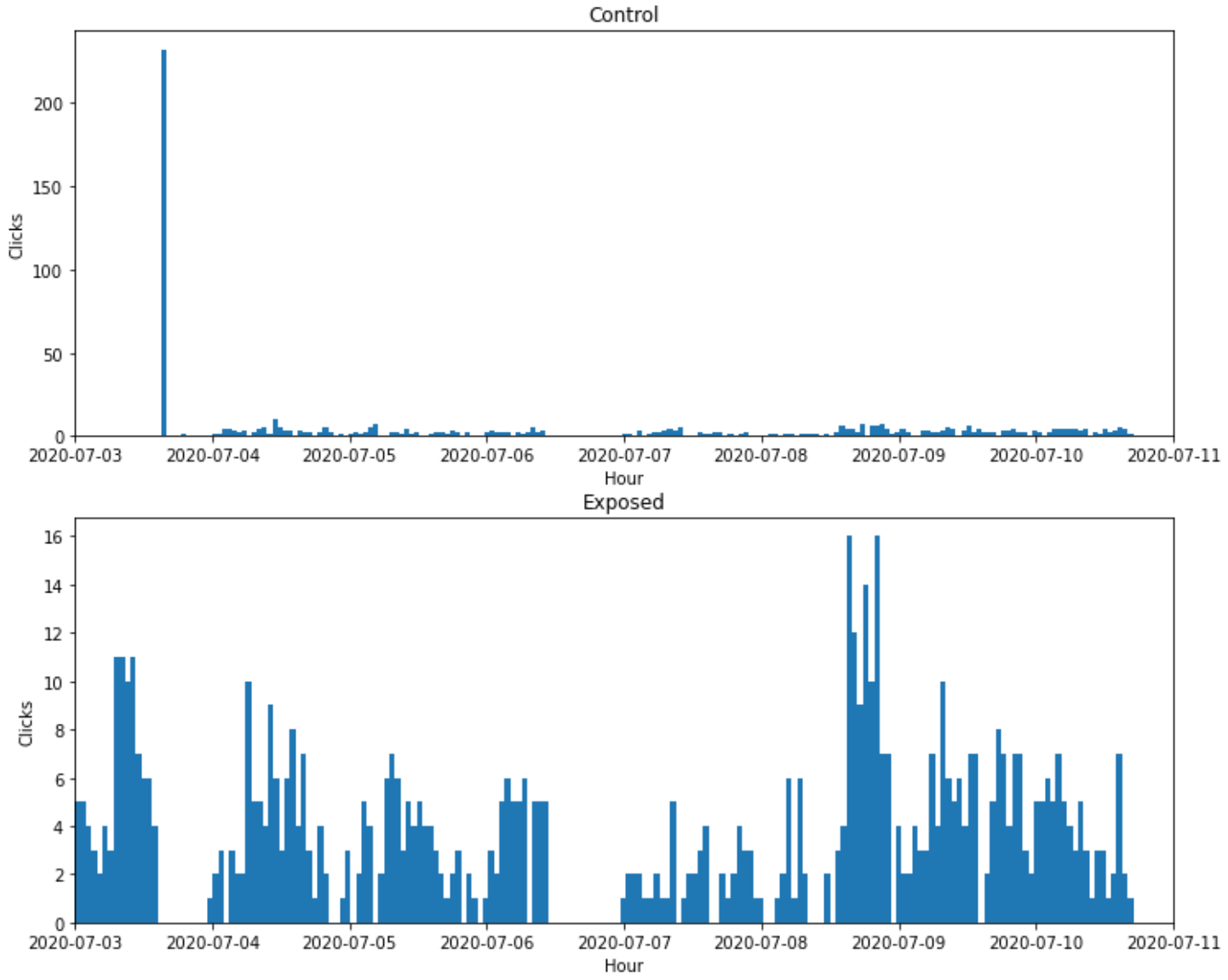
Clicks to Impressions Ratio

- Click ratios (number of yes or no clicks divided by total impressions) for the control (c_click_ratio) and exposed (s_click_ratio) groups.



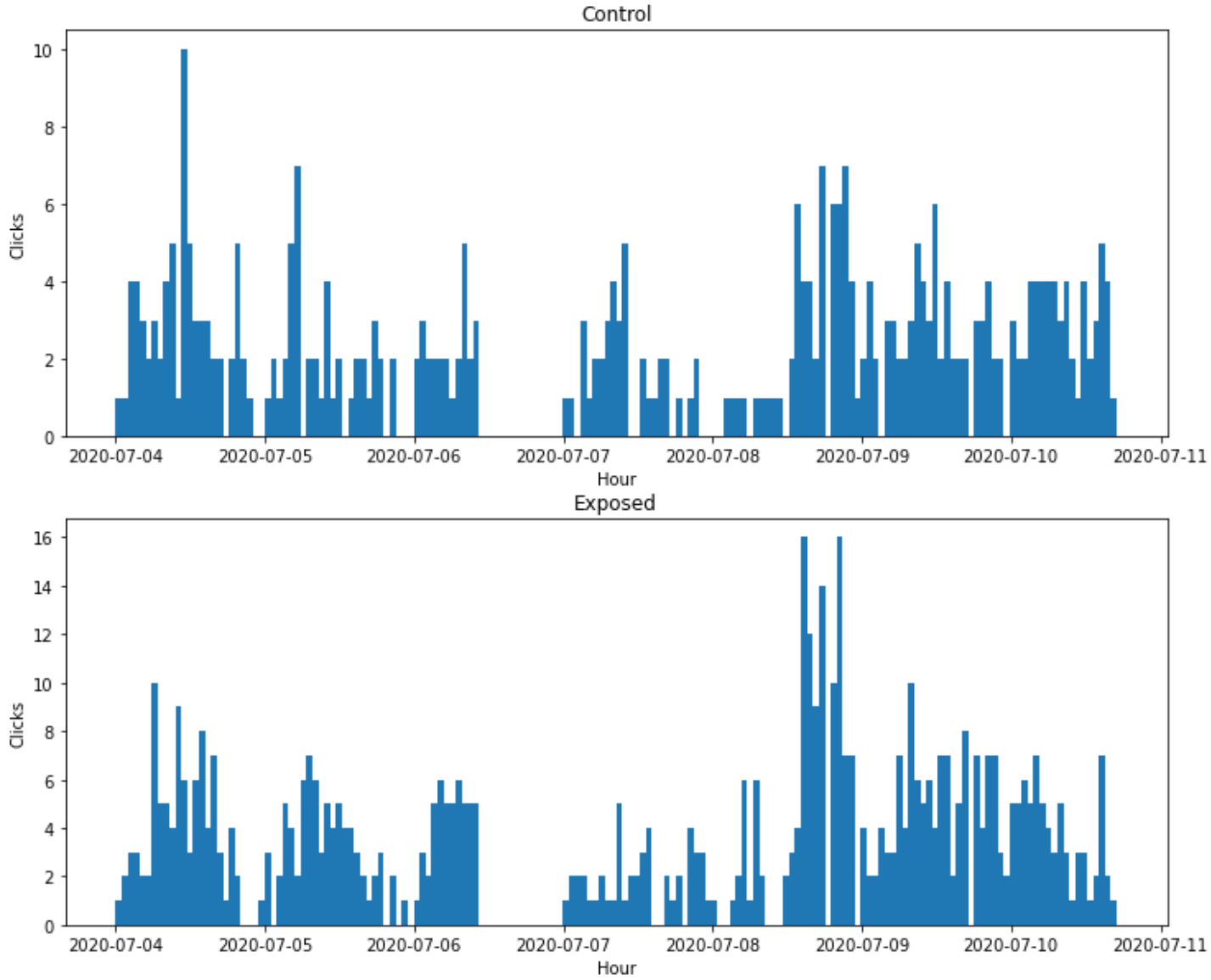
Outliers

- Plotting the number of yes or no clicks over the experiment time interval, one can see that the control dataset has a prominent outlier in the first day.



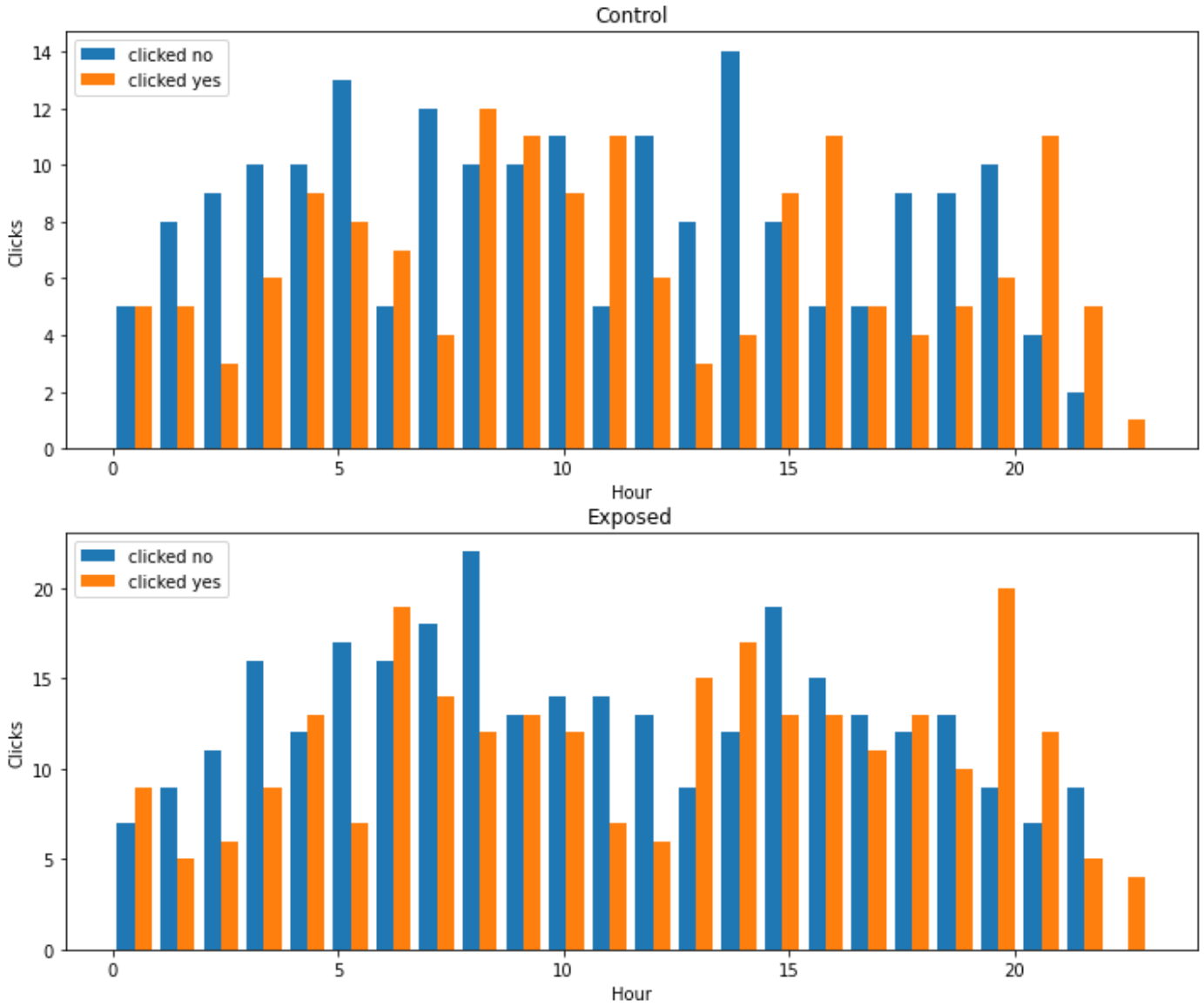
Time Series Histograms

- Excluding the first day to handle the outlier produces these histograms.



Hourly Histograms

- Composite histograms for the control and exposed groups, showing the number of yes (in orange) and no (in blue) clicks for each hour in the days during the experimental period.



Conversion Rate μ_{group} = the percent of clicks that are "yes"

$$\Delta\mu := \mu_{exposed} - \mu_{control}$$

Dataset	Description	$\mu_{exposed}$	$\mu_{control}$	$\Delta\mu$	p-value
1 : Original	Original dataset	46.88%	45.05%	1.83%	0.259
2 : Outliers removed	Dataset 1 excluding data from July 3rd	46.90%	45.33%	1.58%	0.321
3 : Devices restricted	Dataset 2 restricted to 'popular' devices: those comprising more than 1% of the devices in dataset 2	46.28%	46.95%	-0.66%	0.567

As one can see, while for datasets 1 and 2 there was a mildly improved conversion rate for the exposed group over the control group, the p-values for our (1-sided) independence t-tests on all three datasets was large, and surely over our preselected alpha value of $\alpha = 0.05$. Therefore, failing to reject the null hypothesis, we conclude that the measured change in conversion rate when exposed to the AdSmart advertisement was not statistically significant, and thus *the company is not justified in using the new ad*.