We Need to Go Deeper: Measuring Electoral Violence using Convolutional Neural Networks and Social Media - Supplementary Materials

1 Introduction

In this appendix, we provide additional information regarding the characteristics of the tweet-level datasets used to train our convolutional neural network, the performance of our word embedding model trained using *word2vec*, the robustness of our reported results across various choices of parameter settings for both the neural network and clustering algorithm, and a qualitative codebook which describes the methodology used to determine if the events discovered by our algorithm are indeed related to the electoral process. We also provide tables with short descriptions of each discovered event for those interested in the nature of the data coded by our neural network. Links to replication code and data are provided in the main text of the manuscript in footnote 7.

1.1 Key Words used to Collect Tweets

On page 10 of the manuscript, we note that we used the Twitter Streaming API to conduct a keyword search for various words we believed to be indicative of electoral violence for each election. We provide a table with the keywords here such that other researchers can understand how we collected our tweet-level datasets. We note in the text that we relied on a two-tired coding ontology to judge if a tweet referenced electoral violence. First, tweets were coded as referencing the election or not referencing the election. Then, out of only those tweets that were deemed to be referencing the election, we further coded a tweet by hand if it referenced a violent event or not. Table 1 below gives the words we searched for that determined if a tweet was related to the election, and words that determined if a tweet referenced a violent event.

We utilized a combination of words related to violence (kill, violence, gunshot, ambush, shoot, protest, assault, attack), to elections (vote, election, GhanaDecides, PHVote, politic, ballot) and to actors related to the election (El6DGanaChaveze, PHVoteDuterte, new patriotic party) to collect our tweets. As can be seen in the Table, we used a combination of words and hashtags to determine the relevance of each tweet to the electoral process, along with individual words and phrases. The tweets that were collected according to this keyword search were

Election	Keywords
Venezuela	7D,6DGanaChávez,AbajoALalzquierda,CuentaRegresiva El6DGanaChaveze,ElCambioEstaEnLaEsquina,eleccionesAN guachiman6d,laManitoNiDeVaina,MiQuerenciaEsVenezuela,SOSVzla pasoloquepase,YoDefiendoMiRevolucion,VenezuelaQuiere,victoriaPerfecta eleccion,violencia,votar,pistola,armas,ametralladora,ataque electora,muerto,miedo,muerte,asesinato,disparar,fraude muere,delincuente,herido,agreden,asesinar,guachiman,protesta
Philippines	PHVote,Halalan2016,PiliPinas2016,VotePH2016,PiliPinasDebates2016 RoxasRobredo,IVotePH,Elections2016,PHVoteDuterte,Eleksyon2016 MIRIAM2016,Binay,Poe,philippineelection2016,Philippines vote Philippines fraud,Philippines kill,Philippines violence violence,attack,dead,fraud,assault,protest,intimidation,unrest gunshot,racial,die,kill,threat,vote buying,murder,corrupt terrorize,ambush,explosion,shoot,fire,harass,injure,burn selling vote,cheating,election
Ghana	national democratic party,national democratic congress,new patriotic party convention people's party,progressive people's party,all people's congress NDP,NDC,NPP,CPP,PPP,APC,EIBElection,PulseElection,GHElection GhanaElection,GhanaDecides,ElectionHQ,Ghana2016 poll,vote rigging,politic,fraud,assault,protest,intimidation unrest,corrupt,kill,gunshot,injured,threat,cheat,security rally,death,attack,violence,burn,clash,ballot,campaign

Table 1: Examples of keywords used with the Twitter API to collect tweets related to each election

then added to pools of tweets according to the weighting model described in the text and visually displayed in Figure 1 in the main text.

1.2 Inter-coder Reliability

Also on page 10 of the manuscript, we described the process by which we hand coded our data. We note that we have provided a table showing the level of inter-coder agreement for the hand-labeled training datasets. This information in Table 2 is provided below. As is clear from the table, there was good agreement across all five coders for each election. Cohen's kappa measures inter-coder agreement for categorical, or factor, variables, which was relevant for our purposes.

Country	Inter-Coder Reliability
Venezuela	68.9%
Philippines	75.4%
Ghana	73.1%

Table 2: Overall inter-coder agreement using Cohen's *kappa*

2 Statistics of the Tweet Level Datasets

On page 10 of the manuscript, we direct readers to find in the supplementary materials a Table with statistics for our tweet level datasets used to train the neural network. This table is reproduced blow for those interested in the size and class-imbalance of the datasets for each respective election.

Election	Language	Election-related		Non-Election	Total
		Violence	None		
Venezuela	Spanish	294	1890	3,474 (60%)	5,747
Philippines	English	193	1562	2,408 (58%)	4,163
Ghana	English	188	1075	1,999 (61%)	3,253

Table 3: Summary Statistics of the tweet-level datasets

3 Performance of the Word Embedding Models

Here we provide some visual information regarding the performance of our word embedding models. The performance of our word embedding model is not our primary concern, but we do note here that the model can be said to have preformed reasonably well. Looking at the clustering of words in the English-language elections, for example, we clearly see distinct clusters of similar words referencing violence. Since these are visualizations of a randomly initialized linguistic space, the values of the x and y-axes have no substantive interpretation, but there is a cluster of words in the middle of the embedding space, shown in Figure 1, for the election in Ghana that show related violent words. These words are "death", "killed", "attack", "clashes", "police", "protests", and "threats". The cluster of words referencing violence in the Philippine election, shown in Figure 2, are "death", "killing", "murder", "poll", "attack", and "violence".

The word embedding model for the Venezuelan election shows similar performance by the word embedding model. Because a number of words overlap in the embedding space, Figure 3 is a bit more difficult to read, by again, in the middle of the figure are words like "revolution", "muerto", "muertos", "violencia", "assessino", and "asesinar".

Since different words all referencing violence tend to cluster together in the various embedding spaces for each election, we are confident that our word embedding model is preforming well.

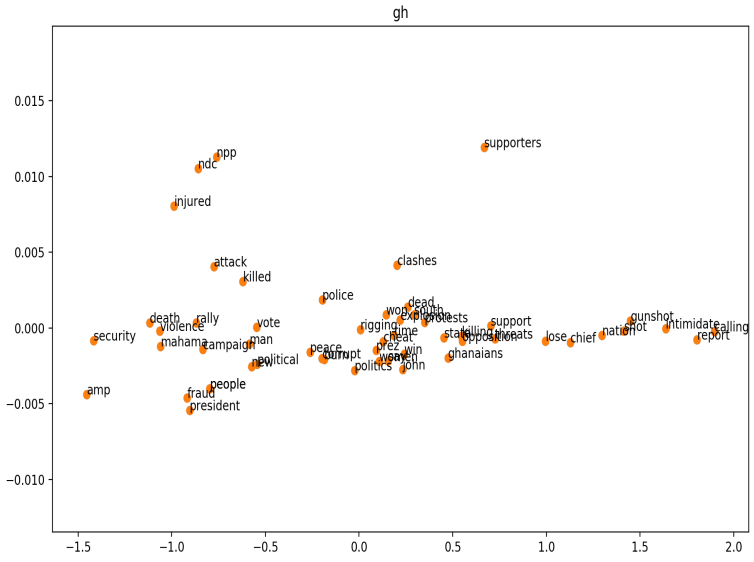

Figure 1: Word Embedding Space: Ghana Election

4 Robustness of the Network to Alternative Parameter Settings

We note in the main text on pages 21-22 that the result reported in the main text, that the convolutional neural network is a superior classifier of electoral violence compared to the support vector machine, and is robust across multiple parameter settings of both the work embedding model as well as various parameter settings of the neural network itself. Those interested in viewing these results should look up Yang, Macdonald, and Ounis (2018) as referenced in the bibliography of the manuscript.

According to the tables presented in Yang, Macdonald, and Ounis (2018), the convolutional neural network consistently has higher classification accuracy as measured by the F1 score across multiple window sizes and multiple word embedding dimension sizes across both elections. This demonstrates the robustness of the neural network compared to the support vector machine is not a result of random chance or lucky parameter settings.

4.1 Variation in Event Clusters by Varying K for K-Means Clustering

We discuss in footnote 8 on page 26 of the main text that the choice of k for K-Means clustering does not substantively matter for our purposes as long as k is sufficiently large enough to encompass the likely number of violence events

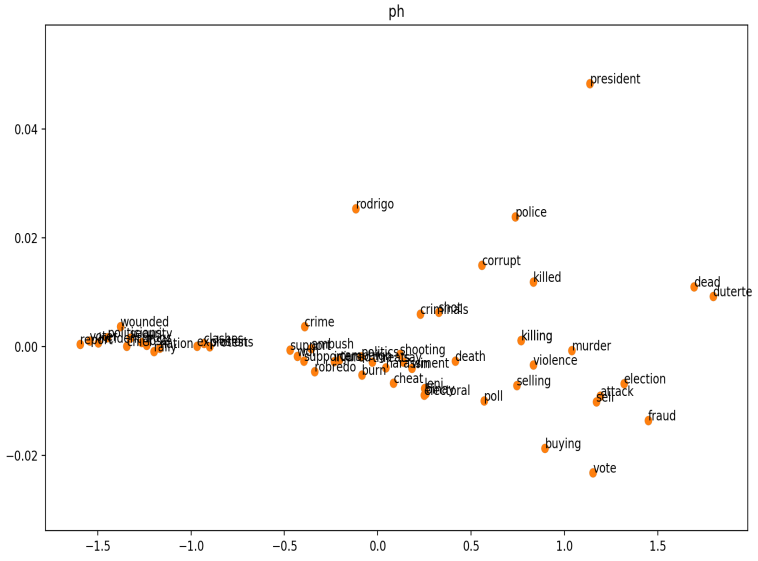

Figure 2: Word Embedding Space: Philippine Election

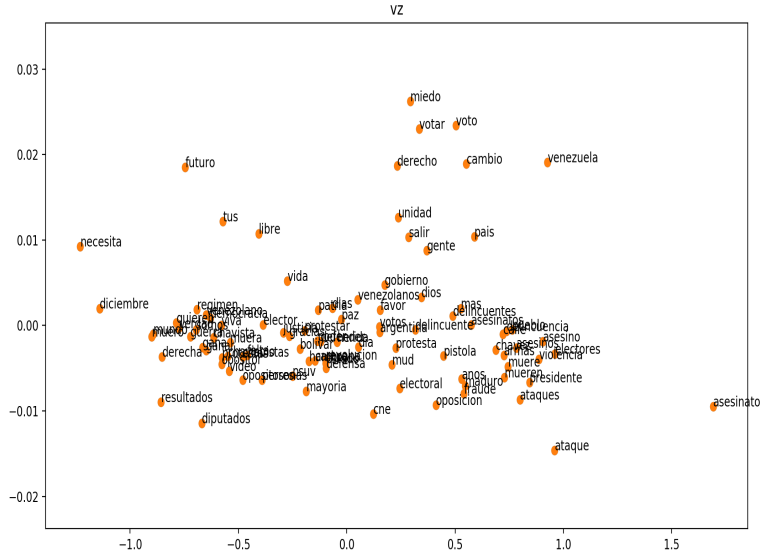

Figure 3: Word Embedding Space: Venezuela Election

during each election. Here we present figures measuring the inter and intra-cluster distance for the convolutional neural network, showing the inter-cluster distance increases as k increases. Substantively, this means that event clusters become more distinct and homogeneous as k increases, since K-Means minimizes cluster variance. The standard errors of these clusters also shrink as distance increases, demonstrating that the homogeneity of the event representations in each cluster increases with k as well. The intra-cluster distance, likewise, decreases as k increases. This suggests, as with the decreasing standard errors of the inter-cluster distances, that events are more homogeneous as k increases. This necessitates increased awareness on the part of scholars to ensure that the events in each cluster of tweets are homogeneous. A smaller k would result in fewer clusters, but the tweet-level events within those clusters would be more mixed. The figure shown below is from an experiment not reported in Yang, Macdonald, and Ounis (2018) and covers events of both electoral violence and electoral malpractice. Our manuscript did not report on electoral malpractice. However, the results of this experiment lend empirical support to our statement in footnote 8 that the exact number set for k generally does not matter as long as it is large enough to ensure that all events are represented by distinct clusters of tweets.

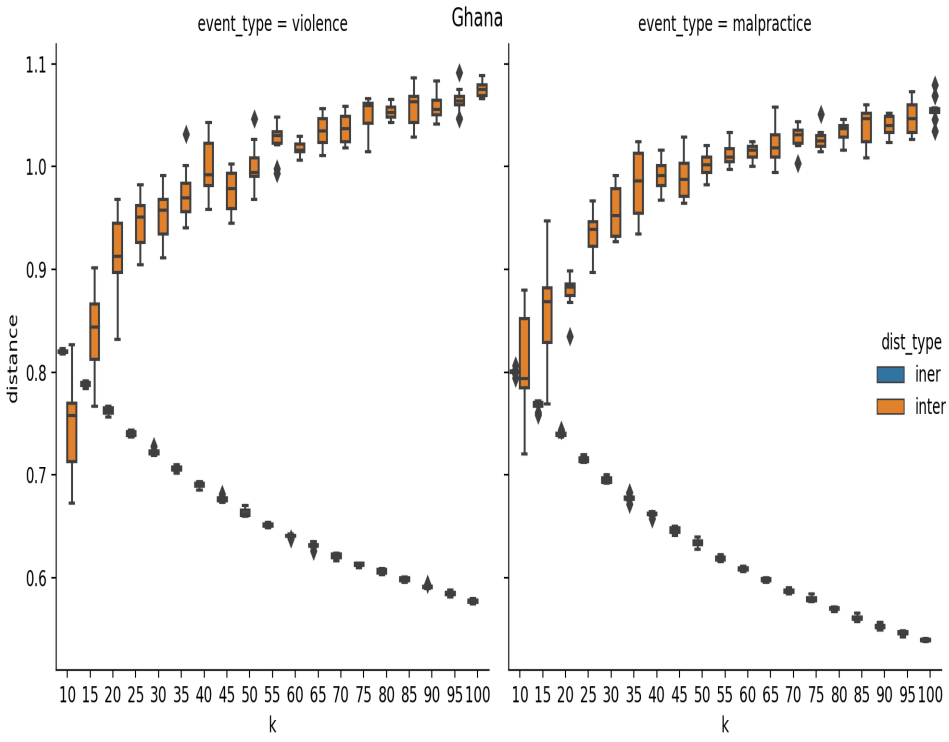

Figure 4: Inter and Intra-Cluster Distance for Ghana

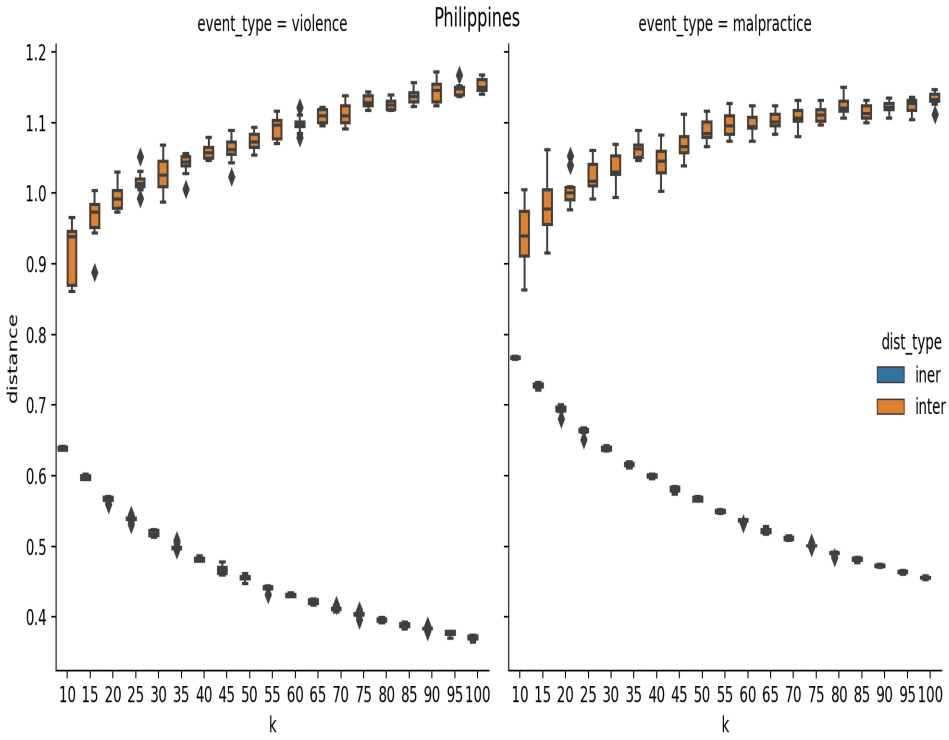

Figure 5: Inter and Intra-Cluster Distance for the Philippines

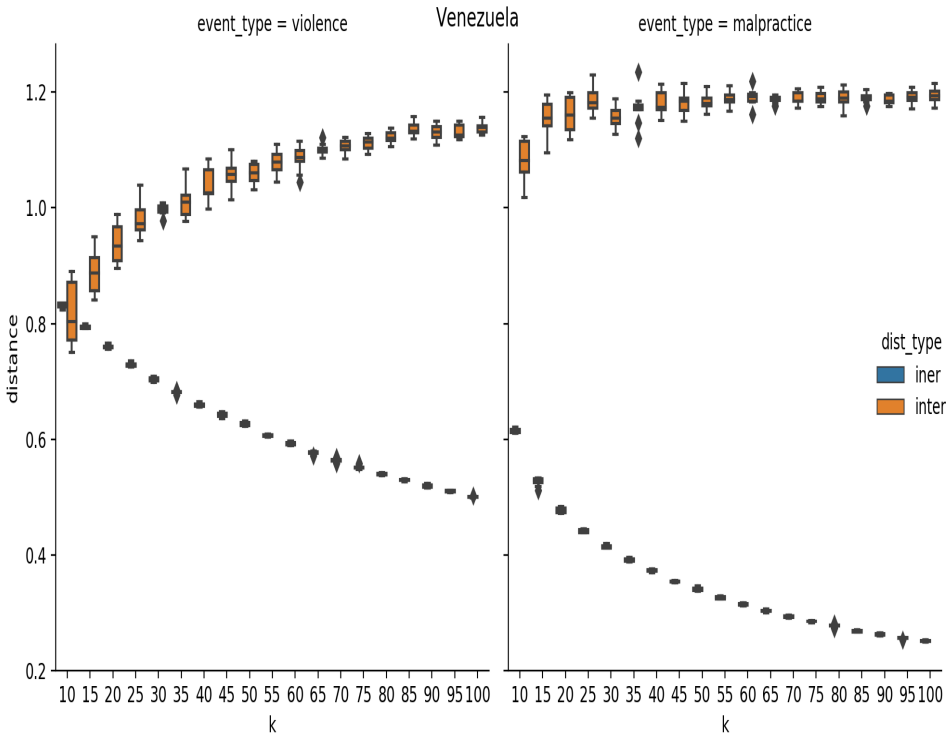

Figure 6: Inter and Intra-Cluster Distance for Venezuela

Table 4: Topic examples from LDA

Topic No.	Topical Terms
1	killed, ppcrv, volunteer, #halalan2016, ambush #phvote, shot, candidate, dead, pagadian
2	election, #halalan2016, #phvote, samar, #eleksyon2016 ambushed, dead, local, results, 2016
3	maguindanao, precinct, inside, #halalan2016, dead reporters, shot, #pilipinas, @inquirerdotnet, #voteph2016
4	elect, bombing, mayor, cebu, philippine #phvote, city, @phvote, @sunstarcebu, osmena
5	philippine, #2016, election, day, dead violence, @france24, ambush, 7, cavite

4.2 Discovering Location using Clustering

A benefit of our clustering procedure was the recovery of approximate spatial location of violence. Less than 1% of all tweets are geolocated, making accurate location of events across space difficult. Yet when reporting on electoral violence, people generally tweeted that a violent event was occurring in a specific location. The clustering algorithm used this information to cluster tweets. Not only could tweets be clustered by identifying information related to who was attacked and how, but tweets often contained locations of where an event happened, allowing us to infer where an event happened as well. Latent Dirichlet Allocation topic modeling was used to examine the most common topics across each cluster in the data. Table 4 below shows how LDA and the clustering algorithm utilized information about locations to assign a physical location to an event during the Philippine election, even when a tweet was not geocoded.

5 Qualitative Codebook

In this section we lay out the qualitative coding rules for all data as expressed in the main text.

For an event to be "**strongly**" related to the election, it must be determined that at least one event actor - the perpetrator or the victim - must have a clear relationship to the election, *and* the description of the event as contained in any additional text from a linked webpage, or additional notes describing an event in an existing dataset, must contain explicit reference that the motive of the event was electoral in nature.

For example, this event, discovered by the neural network in Ghana should be coded as "strongly" related to the eleciton:
12/07/2016 - **Supporters of NDC/NPP clash at Dzodze.** From the linked news report.

"One person sustained a head injury following a clash between sympathizers of the New Patriotic Party (NPP) and the National Democratic Congress (NDC) at Deme, a border town at Dzodze in the Ketu North Constituency. Mr Redeemer Dedzo, Volta Regional Police Commander told the Ghana News Agency that the clash occurred when some sympathizers of the NPP tried to physically prevent voters in the border community from coming to vote. He said in the process of preventing the voters, a scuffle ensued between them and sympathizers of the NDC, during which one Xorla Ahiablame was hit on the forehead with a club."

The actors are identified as the NPP and the NDC, both political parties, and therefore this event passes the first test; all actors involved are related to the electoral process. Secondly, the event occurred when NPP partisans attempted to prevent people in the community from exercising their right to vote. This event passes the second test; the motive for the violence was clearly electoral in nature. In the absence of this mob's presence, people could have voted peacefully.

Likewise, this event in ACLED should also be coded as "strongly" related to the election:
11/11/2016 - Riots/Protests - Rioters (Ghana) - NPP: National Patriotic Party vs. Rioters (Ghana) - notes: *Clashes between NPP and NDC supporters at Nima in Accra, after NDC supporters staged a health walk around the residence of one of their Presidential party candidate and deviated from the agreed route by walking in proximity to the premises of an opposition NPP flagbearer. NDC supporters allegedly threw stocks at the NPP flagbearers house and tore down posters, while NPP supporters fired shots in the air. Both sides traded accusations over which party instigated the clashes.*

The actors are identified as the NPP and NDC. The motive for engaging in the violence is clearly motivated by the provocative actions of the NPP partisans who deviated from the agreed protest route and engaged the NDC counter-protesters directly.

For an event to be "**probably**" related to the election, it must be the case that at least one actor - the perpetrator or victim - must have a clear relationship to the election, *however*, the motive for engaging in this violence has more ambiguity as to whether it is related to the election or not.

For example, this event, discovered by the neural network should be coded as "probably" related to the election
9/23/2016 - **Adom FM reporter assaulted by NDC thugs**. From the linked news report

"One of Adom FM's Central Region correspondents has been assaulted by

thugs said to be members of the ruling National Democratic Congress (NDC). Kofi Adjei reported that, while waiting outside the court room to do some interviews, a lady approached him and accused him of doing negative stories against government. In his attempt to explain himself, he said the lady ordered some party men holding stones and sticks to beat him to serve as a lesson to others."

At least one actor - the perpetrator - is identified as NDC partisans. The motive for this attack, however, is more vague, and is probably related to the election. However, the motive here appears simply to be an opaque reference to a "lesson to others", and the causal relation to the election is not definitive.

This event in ACLED should also be coded as "**probably**" related to the election:
11/08/2016 - Violence against civilians - Unidentified Armed Group (Ghana) - vs. Civilians - notes: *Unidentified gunmen fired shots at an NPP rally in Accra's Odododiodioo Constituency, leaving two people injured. The local security committee suspended all political activities in the 13 constituencies of the Accra Metropolis.*

The actors are vague (unidentified armed group vs. civilians), though the notes in ACLED specify the civilians were members of the NPP, an actor with a clear link to the election. The motive for this violence is not given. It is the identity of the victims (the NPP) that classifies this event as "probably" related to the election.

For an event to be coded as "**Probably Not Election Related**" the identity of both actors should be ambiguous, and their connection to the election unclear. The motive for the violence should also be unclear.

For example, this event, discovered by our neural network for the Philippine election, should be coded as "probably not related to the election".
HPG assistant team leader shot dead in Matnog. From the linked news report
The assistant team leader of the Philippine National Police-Highway Patrol Group (HPG) was shot dead in Matnog, Sorsogon Wednesday evening. Three male suspects between 20 to 25 years old were said to be the culprits behind the crime, but police have yet to determine their motives.

The identity of the perpetrator and victim are not strongly related to the election, and no motive was given for why the violence took place.

Similarly, this event from ICEWS during the Philippine election should also be coded as "probably not related to the election".
4/10/16 - Citizen (Philippines) - General Population / Civilian / Social,Social - Use unconventional violence - against Military (Philippines) - Military,Government

The identities of the perpetrator ("Citizen") is vague and its relationship to the election cannot be determined. The use of unconventional violence identifies the event as violence, but neither the identity of Actor 1 ("Civilian"), nor Actor 2 ("Military") can be definitively linked with the electoral process. Further, little other information exists about the motive for this violence.

For an event to be coded as "**Not Related to the Election**" the identity of both actors must be unclear or their relationship to the electoral process must be held in substantial doubt. Further, the motive for engaging in violence, if given, must be completely unrelated to the election.

For example, this event discovered by our neural network during the Venezuelan election should be coded as "not related to the election".
11/5/15 - **Venezuelan opposition activist detained in Miami before fleeing to Caracas.** From the linked news report:

"A Venezuelan exile activist is now awaiting trial in federal court after being arrested at Miami International Airport (MIA) Monday while trying to escape to Venezuela to avoid prosecution in an immigration fraud case, court records show."

The sole actor in this event, an activist, was arrest in Miami, hundreds of miles from Venezuela, and the nature of this event was an immigration fraud case, something completely unrelated to the Venezuelan election.

And this event, discovered by ICEWS during the Venezuelan election, should also be coded as "not related to the election".
11/25/15 - Attacker (Venezuela) - Criminals / Gangs,Dissident - fight with small arms and light weapons - vs. Citizen (Venezuela) - Social,General Population / Civilian / Social.

The identity of both actors in this event are vague and cannot be connected with any degree of certainty to the election. It also appears from the description of this event that this was a violent fight between gang members and thus would have most likely occurred even in the absence of an election.

The final two categories are "**Related to the Election, but not Violent**" and "**Not Enough Information to Code**". For an event to be coded as "Related to the Election, but Not Violent" an event must be clearly connected to the electoral process, but the event must be nonviolent.

This event discovered by the neural network in the Philippine election falls into the category of "Related to the Eleciton, but not Violent". 5/9/16 - **Binay supporters were intimidated in Basilan and Isabela, had their ballots crumpled** - From the linked text:
"He said the party has recorded 28 defective VCMs in Makati alone, the baili-

wick of Binay, "which resulted in confusion that discouraged voters to cast their vote." The following areas also have malfunctioning VCMs – South Cotabato; Valenzuela; Quiapo, Manila; Oriental and Occidental, Mindoro; Moonwalk, Paranaque; Virac, Catanduanes, Talang, Masbate; General Santos City; Surigao del Sur; Sangandaan; Biliran; Pangasinan; Zamboanga Sibugay; Danao, Cebu; and Rizal."

The event is clearly related to the election, but is nonviolent. Defective vote counting machines were detected that altered people's decision to cast their votes.

Likewise, this event in ACLED during the Ghanaian election is also nonviolent.
11/11/16 - Riots/Protests - Protesters (Ghana) - OLAM: Our Lady of Mercy - Actor 2 left blank - Notes: "*Members of the Our Lady of Mercy (OLAM) Kaana Manga Women Association staged a peace march in the Navrongo Township calling for peace during the upcoming election period and calling on women to use their influential abilities at home to deter acts of violence.*"

ACLED incorrectly categorizes this event as violent, when in matter of fact, the protest/march was entirely peaceful.

Finally, an event can be labeled as "**Not Enough Information to Code**". Only events for which there are no linked news report discovered by the neural network, or for which the nature of at least one participant is left completely blank in ACLED, ICEWS, or SCAD *and* there is no other source of information, like notes, to help code the event, should be coded in such a way.

6 Description of all Events with Related URLs (Where Available)

The following tables list and describe all events collected by our neural network as well as the support vector machine. In these tables we list the date on which the event occurred, provide a short, headline-like, description of the event, identify whether or not a url linking to a verified news media report of the event exists, and report which method discovered the event. Datasets with the associated urls are hosted on the dataverse. Urls are not listed here for aesthetic reasons.

Table 5: All Violent Events Coded for the Philippine Election

Date	Event Description	URL Confirmed?	Method Coded
04/01/2016	Gunshot wound killed Kidapawan protester	Yes	CNN
04/09/2016	Marawi city mayor Sultan involved in ambush	Yes	CNN+SVM
04/11/2016	Liberty Party harassing opposition	No	CNN+SVM
04/13/2016	Isabela vice mayor shot dead by NPA rebels	Yes	CNN+SVM
04/13/2016	Highway Patrol Group team leader shot dead in Matnog	Yes	CNN
04/14/2016	Isabela town bet killed	Yes	CNN+SVM
04/17/2016	Bataan town mayor's aide killed; wife injured	Yes	CNN+SVM
04/19/2016	Campaign manager shot dead in Batangas	Yes	CNN+SVM
04/26/2016	Caloocan cop on stakeout shot dead, buddy wounded	Yes	CNN
04/27/2016	6 Maguindanao poll precincts bombed	Yes	CNN+SVM
04/28/2016	Another Maguindanao school bombed	Yes	CNN+SVM
04/30/2016	Attack on UNA party mate in La Union	Yes	CNN
04/30/2016	2 supporters of Agusan del Norte candidate killed	Yes	CNN+SVM
04/30/2016	Grenade hurled at Siquijor councilor's house	Yes	CNN
05/01/2016	Duterte supporter killed in Cagayan de Oro	Yes	CNN+SVM
05/02/2016	A 64-yr-old woman councilor in Candelaria killed	Yes	CNN
05/02/2016	Duterte supporters harassing opposition	Yes	CNN+SVM
05/04/2016	Supporter of Cebu town mayor shot dead	Yes	CNN+SVM
05/04/2016	4 explosions recorded near Masbate school	Yes	CNN+SVM
05/04/2016	2 killed in in Puerto Princesa City	Yes	CNN+SVM
05/06/2016	Security officer for Batangas vice mayor shot dead	No	CNN+SVM
05/06/2016	Media covering vote buying in Meycauayan harassed	No	CNN+SVM
05/06/2016	Liberal Party councilor in Batangas shot dead	Yes	CNN+SVM
05/07/2016	Mayoral candidate shot dead in Lantapan	Yes	CNN+SVM
05/07/2016	Ambush on mayoral convoy kills 1, injures 3	Yes	CNN+SVM
05/08/2016	Supporters of LP Mayoral Candidate shot dead	Yes	CNN+SVM
05/08/2016	The mayor of Dumanjug shot at by his rival	Yes	CNN
05/08/2016	Bombing incident in Cawayan Masbate	No	CNN+SVM
05/08/2016	Supporters of 2 mayoral candidates in Kalanganan fight	No	CNN+SVM
05/08/2016	Candidate ambushed in front of their house in Barangay	No	CNN
05/08/2016	Civilians in Samar evacuated homes after gunshots	Yes	CNN+SVM
05/09/2016	Mayoral candidate in, Samar ambushed by rival's son	Yes	CNN
05/09/2016	Voter shot dead inside precinct	Yes	CNN+SVM
05/09/2016	Shooting, threats in Cebu town	Yes	CNN+SVM
05/09/2016	7 killed in election day Cavite ambush	Yes	CNN+SVM
05/09/2016	1 shot dead in polling center in Abra	Yes	CNN+SVM
05/09/2016	Grenade exploded near Lanao del Norte school	Yes	CNN+SVM
05/09/2016	Polls in Munai, Lanao Del Norte delayed due to violence	Yes	CNN+SVM
05/09/2016	Voters intimidated in Basilan and Isabela	Yes	CNN
05/10/2016	PPCRV volunteer died in an ambush in Pagadian	Yes	CNN+SVM
05/12/2016	Armed men set fire to VCM, ballots in Samar	Yes	CNN+SVM
05/15/2016	Four dead as Philippine clans clash over election	Yes	CNN+SVM
05/27/2016	Reporter killed in Quiapo gun attack	Yes	CNN+SVM
05/27/2016	Maguindanao councilor shot dead in South Upi town	Yes	CNN+SVM
05/28/2016	2 kids hurt in attack in Maguindanao town	Yes	CNN
06/04/2016	Philippine president-elect urges public to kill drug dealers	Yes	CNN+SVM
06/09/2016	Bounty offered to kill Philippine president-elect	Yes	CNN+SVM

Table 6: All Violent Events Coded for the Ghanaian Election

Date	Event Description	URL Confirmed?	Method Coded
09/22/2016	Military attack NPP's Hopeson Adorye	Yes	CNN+SVM
09/22/2016	EC closes Buipe office over NDC, NPP clash	Yes	CNN
09/23/2016	Reporter assaulted by NDC thugs	Yes	CNN+SVM
10/02/2016	NPP, NDC Supporters Clash In Bisease	Yes	CNN+SVM
11/01/2016	Husband of candidate assaults journalist	Yes	CNN+SVM
11/06/2016	Man assaulted for gesturing at Mahama's convoy	Yes	CNN+SVM
11/08/2016	Clashes disrupt Sunyani debate	Yes	CNN
11/09/2016	Nii Lante Vanderpuye attacked opponent	Yes	CNN+SVM
11/09/2016	Violent clashes between NPP and NDC	Yes	CNN+SVM
11/10/2016	NPP intimidating NDC supporters in Volta	Yes	CNN+SVM
11/11/2016	PNC supporters clash in Nadowli Kaleo	Yes	CNN+SVM
11/13/2016	Attack on Akufo-Addo residence	Yes	CNN+SVM
11/13/2016	NDC and NPP supporters clash	Yes	CNN+SVM
11/14/2016	NDC, NPP supporters clash	Yes	CNN+SVM
11/14/2016	NDC, NPP supporters clash in Wulensi	Yes	CNN+SVM
11/15/2016	NPP supporters clashed with demonstrators	Yes	CNN+SVM
11/15/2016	Parties supporters clash at Yendi	Yes	CNN+SVM
11/17/2016	NDC, NPP supporters clash in Wulensi again	Yes	CNN+SVM
11/18/2016	Gunmen attack NPP candidate for Asunafo South	Yes	CNN+SVM
11/20/2016	5 injured in NDC NPP clash at Asokore	Yes	CNN+SVM
11/21/2016	NPP supported threatened NDC candidate	Yes	CNN+SVM
11/25/2016	NDC, NPP supporters clash in Wulensi	Yes	CNN+SVM
11/29/2016	NPP MP aspirant for Asunafo South was attacked	Yes	CNN+SVM
12/01/2016	Three police officers assault EC officials	Yes	CNN+SVM
12/04/2016	NPP clash with EC over Voter Register	Yes	CNN
12/05/2016	NDC supporters attacked PPP Parliamentary candidate	Yes	CNN+SVM
12/06/2016	Clash between NDC and NPP	Yes	CNN+SVM
12/06/2016	One dead, 14 others injured in NDC NPP clashes	Yes	CNN+SVM
12/06/2016	NDC supporter killed at Dunkwa	Yes	CNN+SVM
12/07/2016	Supporters of NDC and NPP clash at Dzodze	Yes	CNN+SVM
12/07/2016	Election officials attacked at Akumade	No	CNN+SVM
12/07/2016	NPP MP for Bongo, Gabriel Agana attacked	Yes	CNN+SVM
12/08/2016	Gun shots fired to clear crowd at Bawku	Yes	CNN+SVM
12/08/2016	Pollster Ben Ephson was attacked at his residence	Yes	CNN+SVM
12/09/2016	A reporter was attacked by NDC supporters	No	CNN+SVM
12/10/2016	Actor Wofa K attacked by NPP supporters	Yes	CNN+SVM
12/11/2016	NPP supporters attacked an NDC supporter	Yes	CNN+SVM
12/11/2016	NPP, NDC supporters clash	Yes	CNN+SVM
12/12/2016	Various attacks on ONDC supporters	No	CNN+SVM
12/16/2016	NPP and NDC supporters clash at Sankore	Yes	CNN+SVM
12/19/2016	Northern NPP regional chairman attacked	Yes	CNN+SVM
01/03/2017	NPP, NDC supporters clash at Suhum, several injured	Yes	CNN+SVM
01/05/2017	NDC supporters attacked journalist	Yes	CNN+SVM
01/09/2017	NPP supporters attack government installations	Yes	CNN+SVM

Table 7: All Violent Events Coded for the Venezuelan Election

Date	Event Description	URL Confirmed?	Method Coded
11/03/2015	Ten injured in student march	Yes	CNN
11/05/2015	Venezuelan opposition activist detained	Yes	CNN+SVM
11/06/2015	Ismael Garcia and tour chief wounded in ambush	Yes	CNN
01/08/2016	Indigenous leaders arrested	Yes	CNN
11/09/2015	Henrique Capriles attacked during a visit in Yare	Yes	CNN+SVM
11/12/2015	UCV students assaulted in Magallanes-Leones	Yes	CNN+SVM
11/18/2015	Three students shot	No	CNN
11/18/2015	Lilian Tintori attacked at Cojedes	Yes	CNN+SVM
11/22/2015	Miguel Pizarro's convoy attacked in Petare	Yes	CNN+SVM
11/23/2015	Kidnapping of three opposition activists	Yes	CNN+SVM
11/25/2015	Lilian Tintori attacked in Valle de la Pascua	Yes	CNN+SVM
11/25/2015	Armed groups attacked activists of VP in Guarico	Yes	CNN+SVM
11/25/2015	Opposition politician Luis Manuel Diaz killed	Yes	CNN+SVM
11/25/2015	Opposition attacked in San Felix	No	CNN+SVM
12/03/2015	Several injured in demonstrations at national assembly	Yes	CNN
12/04/2015	Journalist assaulted at election center	Yes	CNN+SVM
12/05/2015	GNB assaulted UNERMB students in Baralt/Zulia	No	CNN+SVM
12/05/2015	Paramilitary violence in Tachira	Yes	CNN
01/05/2016	Jose Brito assaulted by the GNB at national assembly	No	CNN
12/05/2015	Shooting in electoral center in Aragua.	Yes	CNN+SVM
12/06/2015	Attacks against opposition in Carabobo	Yes	CNN+SVM
12/06/2015	Journalism student killed	Yes	CNN+SVM
12/06/2015	Persecution of student candidate Vilca Fernandez	Yes	CNN+SVM
12/06/2015	Armed groups are found and shot in Beatriz	No	CNN+SVM
12/06/2015	Offender died threatening voters	Yes	CNN
12/06/2015	Young men were hurt at a polling station in Caricuao	Yes	CNN
12/06/2015	A woman who removed PSUV poster attacked by mob	Yes	CNN+SVM
12/06/2015	Motorized people assaulting, intimidating voters	No	CNN+SVM
12/06/2015	Reporter attacked by thrown stones	No	SVM
12/06/2015	Pro-government supporters intimidate opponents	Yes	CANN+SVM
12/06/2015	PSUV motors rally polling center in Montalban	Yes	CNN+SVM
12/06/2015	Journalist attacked in Liceo Fermin Toro	Yes	CNN+SVM
12/06/2015	PSUV intimidating voters in Ruiz Pineda-Caricuao	No	CNN
12/06/2015	MUD campaign manager arrested in Aragua	Yes	CNN
12/06/2015	People intimidating voters in Valera	No	CNN+SVM
12/10/2015	PSUV members attacked in national assembly	Yes	CNN
12/10/2015	Former ministers verbally assaulted	Yes	CNN+SVM
12/15/2015	Students assaulted by GNB	No	CNN+SVM
12/16/2015	Students attacked by the national guard	No	CNN+SVM
12/17/2016	Opposition councilor arrested	No	CNN
12/29/2015	Opposition activist assassinated	Yes	CNN
01/04/2016	Groups assaulted Ramos Allup in National Assembly	Yes	CNN+SVM
01/05/2016	Government supporters assaulted reporters	Yes	CNN+SVM
01/05/2016	Opposition deputies attacked outside national assembly	Yes	CNN+SVM
01/06/2016	Reported irregular situation around the national assembly	Yes	CNN+SVM
01/07/2016	Explosive devices launched at opposition headquarters	Yes	CNN