# Appendix of RaTSS: Identifying Culprits in Multivariate Time-series for Urban Analytics

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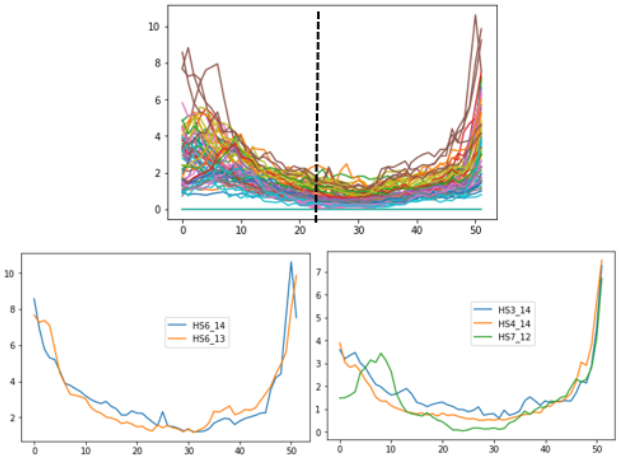



Fig. 1. **CDC weekly influenza count on all the HHS regions in US. The segmentations obtained try to give cutpoints when there starts high influenza cases (higher than normal threshold), and during normal influenza cases. RaTSS captures three different HHS regions (3, 4, 7) and two different seasons 2014-15 and 2012-13 which have similar flu seasons.**

## I. Additional dataset and experiments

### A. Additional Case-studies: Hurricane Irma

Fig. 3 shows our rationalizations for Hurricane Irma.

### B. Additional Case-studies: Hurricane Harvey

Fig. 2 shows our rationalizations for Hurricane Harvey.

### C. *Find-RaTSS* on Additional Flu data

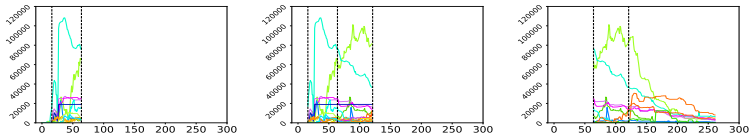
### D. Additional Case-studies FLU2:

Fig. 1 shows culprits found in *flu2* data.

TABLE I
**Feature Ablation test in terms of F1-score for Ground-truth datasets. $f_1$: mean, $f_2$: variance, $f_3$: min, $f_4$: max**

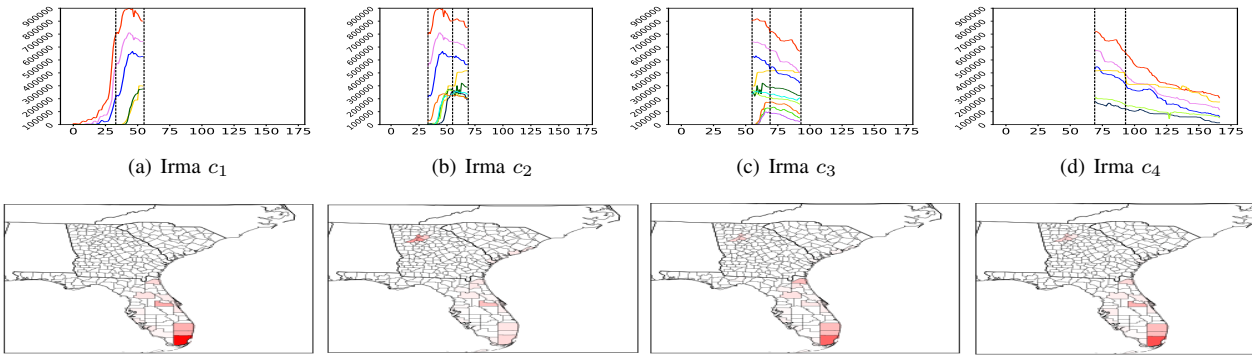
| **Dataset** | **Features removed** | | | |
|---|---|---|---|---|
| | $f_1$ | $f_2$ | $f_3$ | $f_4$ |
| *Gaussian* | 0.52 | 0.44 | 0.49 | 0.64 |
| *ChickenDance* | 0.73 | 0.86 | 0.401 | 0.643 |
| *Great Barbet* | 0.5 | 0.5 | 0 | 1.0 |

*1) Feature ablation test: Sensitivity to F.:* For feature robustness by we use feature ablation test. Tbl. I shows how rationalization affected on the Synthetic, ChickenDance and GrandMal dataset by removing each feature used in RaTSS



(a) Harvey $c_1$ (b) Harvey $c_2$ (c) Harvey $c_3$

Fig. 2. **Find-RaTSS can find the most affected counties for the segmentation in hurricane Harvey (a). Segmentation are chosen in terms of severity of damage from historical timeline. For the corresponding $c_j$, top $k$ rationalizations are shown in Fig. 2(a)- 2(c) similar to Hurricane Irma.**



(a) Irma $c_1$ (b) Irma $c_2$ (c) Irma $c_3$ (d) Irma $c_4$

(e) Irma $r_1$ (f) Irma $r_2$ (g) Irma $r_3$ (h) Irma $r_4$

Fig. 3. **Find-RaTSS finds the most affected counties facing damage. The rationalizations $\mathbf{r}_j$ for corresponding $c_j$ are mapped in US county map (Higher $r_j^u$ with brighter red).**