Interacting with VW in active learning

Nikos Karampatziakis Cloud and Information Sciences Lab Microsoft

NIPS 2013

▶ Situation: unlabeled (+little labeled) data

- ► Situation: unlabeled (+little labeled) data
- Start with whatever data is available

- ► Situation: unlabeled (+little labeled) data
- Start with whatever data is available
- ► Learner interacts with teacher to learn more

- ► Situation: unlabeled (+little labeled) data
- Start with whatever data is available
- ► Learner interacts with teacher to learn more
- ▶ In VW interaction consists of

- ► Situation: unlabeled (+little labeled) data
- Start with whatever data is available
- Learner interacts with teacher to learn more
- ▶ In VW interaction consists of
 - Teacher gives unlabeled example to VW

- ► Situation: unlabeled (+little labeled) data
- Start with whatever data is available
- Learner interacts with teacher to learn more
- In VW interaction consists of
 - Teacher gives unlabeled example to VW
 - ▶ VW decides whether and how much it needs that label

- ► Situation: unlabeled (+little labeled) data
- Start with whatever data is available
- Learner interacts with teacher to learn more
- In VW interaction consists of
 - Teacher gives unlabeled example to VW
 - VW decides whether and how much it needs that label
 - Teacher can provide the label (not obliged to)

- Situation: unlabeled (+little labeled) data
- Start with whatever data is available
- Learner interacts with teacher to learn more
- In VW interaction consists of
 - Teacher gives unlabeled example to VW
 - VW decides whether and how much it needs that label
 - Teacher can provide the label (not obliged to)
- ▶ The result is an importance weighted dataset

- ► Situation: unlabeled (+little labeled) data
- Start with whatever data is available
- Learner interacts with teacher to learn more
- In VW interaction consists of
 - Teacher gives unlabeled example to VW
 - VW decides whether and how much it needs that label
 - ► Teacher can provide the label (not obliged to)
- ▶ The result is an importance weighted dataset
- No selection bias so can be used any way you like

A simple demonstation of how to interact with VW

- A simple demonstation of how to interact with VW
- Assuming

- A simple demonstation of how to interact with VW
- Assuming
 - binary classification

- A simple demonstation of how to interact with VW
- Assuming
 - binary classification
 - examples are in human readable form (text)

- A simple demonstation of how to interact with VW
- Assuming
 - binary classification
 - examples are in human readable form (text)
- Connects to the host:port VW is listening on

- A simple demonstation of how to interact with VW
- Assuming
 - binary classification
 - examples are in human readable form (text)
- Connects to the host:port VW is listening on
- Sends any initially available labeled data

- A simple demonstation of how to interact with VW
- Assuming
 - binary classification
 - examples are in human readable form (text)
- Connects to the host:port VW is listening on
- Sends any initially available labeled data
- Sends unlabeled examples one by one

- A simple demonstation of how to interact with VW
- Assuming
 - binary classification
 - examples are in human readable form (text)
- Connects to the host:port VW is listening on
- Sends any initially available labeled data
- Sends unlabeled examples one by one
 - Waits for VW's response

- A simple demonstation of how to interact with VW
- Assuming
 - binary classification
 - examples are in human readable form (text)
- Connects to the host:port VW is listening on
- Sends any initially available labeled data
- Sends unlabeled examples one by one
 - Waits for VW's response
 - If VW does not want the label, sends the next

- A simple demonstation of how to interact with VW
- Assuming
 - ▶ binary classification
 - examples are in human readable form (text)
- Connects to the host:port VW is listening on
- Sends any initially available labeled data
- Sends unlabeled examples one by one
 - Waits for VW's response
 - ▶ If VW does not want the label, sends the next
 - ▶ Otherwise, VW's response includes an importance

- A simple demonstation of how to interact with VW
- Assuming
 - binary classification
 - examples are in human readable form (text)
- Connects to the host:port VW is listening on
- Sends any initially available labeled data
- Sends unlabeled examples one by one
 - Waits for VW's response
 - If VW does not want the label, sends the next
 - ▶ Otherwise, VW's response includes an importance
 - Asks the user for the label

- A simple demonstation of how to interact with VW
- Assuming
 - binary classification
 - examples are in human readable form (text)
- Connects to the host:port VW is listening on
- Sends any initially available labeled data
- Sends unlabeled examples one by one
 - Waits for VW's response
 - If VW does not want the label, sends the next
 - ▶ Otherwise, VW's response includes an importance
 - Asks the user for the label
 - If user skips, sends the next

- A simple demonstation of how to interact with VW
- Assuming
 - binary classification
 - examples are in human readable form (text)
- Connects to the host:port VW is listening on
- Sends any initially available labeled data
- Sends unlabeled examples one by one
 - Waits for VW's response
 - If VW does not want the label, sends the next
 - ▶ Otherwise, VW's response includes an importance
 - Asks the user for the label
 - If user skips, sends the next
 - ▶ Otherwise, we have a new labeled weighted example

- A simple demonstation of how to interact with VW
- Assuming
 - binary classification
 - examples are in human readable form (text)
- Connects to the host:port VW is listening on
- Sends any initially available labeled data
- Sends unlabeled examples one by one
 - Waits for VW's response
 - If VW does not want the label, sends the next
 - ▶ Otherwise, VW's response includes an importance
 - Asks the user for the label
 - If user skips, sends the next
 - ▶ Otherwise, we have a new labeled weighted example
 - Sends it to VW (causes update).

- A simple demonstation of how to interact with VW
- Assuming
 - binary classification
 - examples are in human readable form (text)
- Connects to the host:port VW is listening on
- Sends any initially available labeled data
- Sends unlabeled examples one by one
 - Waits for VW's response
 - If VW does not want the label, sends the next
 - ▶ Otherwise, VW's response includes an importance
 - Asks the user for the label
 - If user skips, sends the next
 - ▶ Otherwise, we have a new labeled weighted example
 - Sends it to VW (causes update).
 - Saves it to a file, so can quit anytime.

