

1 \$, & , Q U / D Q 6 X H P P ' L

(W K D O F & F L O G H B O W B L J ' D S Q D V O L F V Q M Q O F D H

& K D H Q O H D Q G 2 S B U W X I Q V B R I U X B D V

- X Q

% L \ U Q L U X Q E D

& H Q W H U (F R Q B P - X W W L

:K\ &(- :RUNV RQ ,QVXUDQFH ,VVXH

Insurance Products Are Financial Security Tools Essential for Individual and Community Economic Development

&(- ZRUNV W **Fair access** UHG Fair treatment IRU LQVXUD
FRQVXPHUV SDUWLFXODUO\ IRU ORZ DQG

Insurance is the Primary Institution to Promote Loss Prevention and Mitigation, Resiliency and Sustainability:

&(- ZRUNV WR HQVXUH LQVXUDQFH LQVWLW
HIIRUWV WR UHGXFH ORVV RI OLIH DQG
DQ **Promote resiliency and sustainability** RI LQGLYLGXDC
EXVLQHVVHV DQG FRPPXQLWLHV

%LUQ\ %LUQEDXP

1\$, & 6X

3HUVRQDO &RQVXPHU ,QIRUPDWLRQ
7HOHPDWLFV ± \$XWR +RPH :H DUDEC
6RFLDO OHGLD
6KRSSLQJ +DELWV 3XUFKDVH +LVWRU
+REELHV DQG ,QWHUHVWV
'HPRJUDSKLFV +RXVHKROG 'DWD &HQ
*RYHUQPHQW 5HFRUGV 3URSHUW\ 5H
:HE ORELOH 3KRQH 7UDFNLQJ 'DWD +
9HKLFOH 5HJLVWUDWLRQ DQG 6HUYL
)DFLDO \$QDO\WLFV
0DLQVWUHP &UHGLW)LOHV /RDQV
\$OWHUQDWLYH &UHGLW 'DWD 7HOHP

6RXUFHV RI 'DWD LQFOXGH FRQVXPHUV
ZH DUDEOH GHYLFHV JRYHUQPHQW GDV
DJJUHJDWRUV DQG PDQ\ RWKHUV

([DPSOHV RI ,QVXUHU %LJ 'DWD \$OJF
3ULFLQJ 8QGHUZULWLQJ

3ULFH 2SWLPL]DWLRQ 'HPDQG ORGHOV

&XVWRPHU 9DOXH 6FRUHV

7HOHPDWLFV

6RFLDO OHGLD 6FRUHV

&UHGLW 6FRUHV

&ULPLQDO +LVWRU\ 6FRUHV

9HKLFQH 6FRUHV

)LUH/LQH 5DWLQJ

\$FFHOHUDWHG /LIH ,QVXUDQFH 8QGHUZU

&ODLPV

&ODLP 2SWLPL]DWLRQ 'HPDQG ORGHOV

)UDXG 6FRUHV

)DFLDO \$QDO\WLFV

6HYHULW\ 6FRUHV

7HOHPDWLFV

%LUQ\ %LUQEDXP

< &HQWHU IRU (FRQRPLF -XVWEDD \$OJRULWMLPV LQ ,QVXUDQFH -XQH

1\$, & 6X

%LJ 'DWD \$OJRULWKPV DV ,QVXUDQFH 0DUN

%LUQ\ %LUQEDXP
< &HQWHU IRU (FRQRPLF -XVWEDD \$OJRULWKPV LQ ,QVXUDQFH -XQH

1\$, & 6X

:KDW¶V 6R %LJ DERXW %LJ 'DWD"

,QVXUHUV¶ XVH RI %LJ 'DWD KDV ~~XXJHUSRWH~~
DQG LQVXUHUV E\ WUDQVIRUPLQJ WK~~B~~Q~~L~~VXU
E\ GLVFRYHULQJ QHZ LQVLJKWV LQWR DQG F
PLWLJDWLRQ

,QVXUHUV¶ XVH RI %LJ 'DWD KDV ~~KXJFFHVS~~O
DQG DIIRUGDELOLW\ RI LQVXUDQ~~NHHS~~~~S~~~~X~~SRU
ZLWK WKH FKDQJHV DQG SURWHFW FRQVXPHU

7KH FXUUHQW LQVXUDQFH UHJXODWRU\ IUDF
SURYLGH UHJXODWRUV ZLWK WKH ~~WRJH~~¶WR
XVH RI %LJ 'DWD %LJ 'DWD KDV PDVVLYHO\
SRZHU RI LQVXUHUV YHUVXV FRQVXPHUV DQG

ODUNHW IRUFHV DORQH ± ³IUHH PDU~~ZLHO~~FR
SURWHFW FRQVXPHUV IURP XQIDLU LQVXUHU
³LQQRYPDWLRQ' ZLWKRXW VRPH FRQVXPHU SU
JXDUGUDLOV ZLOO OHDG WR XQIDLU RXWFRP

%LUQ\ %LUQEDXP

< &HQWHU IRU (FRQRPLF -XVW~~EB~~ \$OJRULW~~MLK~~PV LQ ,QVXUDQFH-XQH

1\$, & 6X

(WKLFD O \$OJRULWKP V DQG 'LVSDUDWH

%LUQ\ %LUQEDXP

< &HQWHU IRU (FRQRPLF -XVWEDD \$OJRULWKP V LQ ,QVXUDQFH -XQH

1\$, & 6X

, QWHQWLRQDO 'LVFULPLQDWLRQ YV 'LVS

, QVXUHUV DUJXH WKDW VWDWHV ¶ X Q Q W L H Q G L V R F C
GLVFULPLQDWLRQ EDVHG RQ UDFH ¶ W Q B L H P [S O L
VHWWOHPHQW

'LVSDUDWH ,PSDFW UHIHUV WR SUDLW FULPHV QDWK
RQ WKH EDVLV RI VDI UDFH KDYH WKKHVEDPVL
IRU WKH GLVFULPLQDWLRQ

, QVXUHUV DOVR DUJXH WKDW 'LVSDUXQMDL P S D F
GLVFULPLQDWLRQ H O D V W D W H L V G S V X U D R V C H F R P S B B W
LQVXUDQFH LV VSH ¶ F I G I L F V D O O X L U R H O D R W U R Q Q) P I L W K H
+RXVLQJ \$FW

, QGXVWU\ 7UDGH \$UJXPHQWV DJDLQVW 'LVSDUD

%LUQ\ %LUQEDXP

< &HQWHU IRU (FRQRPLF -XVWEDD \$OJRULWMLPV LQ ,QVXUDQFH -XQH

1\$, & 6X

:K\ LV 'LVFULPLQDWLRQ RQ WKH %DVLV
&RQVLGHUHG 8QIDLU 'LVFULPLQDWLRF

:K\ DUH UDFH UHOQJLOR QULQGQQDRLGHUHG VX
FODVVLILFDWLRQV E\ WKH 6XSUHPH &RXUW"

WKHUH LV D KLVWRU\ RI GLVFULPLQDWLRQ

%LUQ\ %LUQEDXP

< &HQWHU IRU (FRQRPLF -XVWEDD \$OJRULWMLPV LQ ,QVXUDQFH -XQH

1\$, & 6X

, Q G X V W U \ \$ U J X P H Q W V R Q ' L V S D U D W H , P S

% L U Q \ % L U Q E D X P

< & H Q W H U I R U (F R Q R P L F - X V W E D E \$ O J R U L W M L P V L Q , Q V X U D Q F H - X Q H

1 \$, & 6 X

Big Data Algorithms Can Reflect and Perpetuate Historical Inequities

Big Data's Disparate Impact

\$GYRFDWHV RI DOJRULWKP LV RQO\ DV JRRG DV WKH FGDDWD LW
HOLPLQDWH KXPDQ ELDVHV IURP WKH GHFLVLRQ
DOJRULWKP LV RQO\ DV JRRG DV WKH FGDDWD LW
LQKHULW WKH SUHMXGLFHV RI SULRUJGIMSIUVHLDRG
ELDVHV WKDW SHUVLVW LQ VRFLHWYDW\ WRUJHU
DUH VLPSO\ SUHH[LVWLQJ VRFLHWYDW\ WRUJHU
8QWKLQNLQJ UHOLDQFH QG BQW DHPLEOH RI YX
JURXSV IXOO SDUWLFLSDWLRQ LQ VRFLHWYDW\

%LUQ\ %LUQEDXP
< &HQWHU IRU (FRQRPLF -XVWEDB \$OJRULWKP LQ ,QVXUDQFH -XQH

9 L U J L Q L D (~~Automation~~ *Automating Inequality: How High-Tech Tools*

%LUQ\ %LUQEDXP
< &HQWHU IRU (FRQRPLF -XVWEDD \$OJRULWMLPV LQ ,QVXUDQFH -XQH

:K\ ,V 'LVSDUDWH ,PSDFW 5HOHYDQW IRU
7UDQV8QLRQ &ULPLQDO +LVWRU\ 6F

³7UDQV8QLRQ UHFHQWCH SVEGXDWLHG SRZHU R
UHFRUG YLRODWLRQF GDMQ DLQ DQXGGWQDIILF YLF

³\$OVR DV FRXUW UHFRUGV DUH FUDWVHG ZKHQ
SURLGH LQVLJKW LQWR YLRODWLRQ XERQK
095²VXFK DV YLRODWLRQ GLVPLVDOV YLRODW
DGMXGLFDWHG RU RSHQ WLFNHVV '

What is the likelihood that TU Criminal History Scores have a disparate impact against African-Americans? Consider policing records in Ferguson, Missouri.

86 '2- ,QYHVWLJDWLRQ RI WKH)HUJXVRQ 3RC

)3' DSSHUV WR EULQJ FHUWDLQ RIIHQVSHULFDOR
\$PHULFDQV)RU H[DPVORH IURSPHULFDQ \$PHULFD
DFFRXQWHG IRU RI ODQQHU RI :DONLQJ LQ 5
RI DOO)DLOXUH WR &RPSO\ FKDUJHV

2XU LQYHVWLJDWLRQ LQGLFDWHV WQDSWUWFKDQ C
\$PHULFDQV FDQQRW EH H[SODLQH G EZKDEKGLII
SHRSOH RI GLIIHUHQW UDFHV YLRODWHRWKHDO
UHYHDOHG WKDW WKHVH GLVSDULWLRV RQEXZ
ELDV DJDLQVW DQG VWHUHRW\SHV DERXW \$IUL

3RWHQWLDO IRU 'LVSDUDWH ,PSDFW RI \$Q

\$OJRULWKP V UHIOHFW ELLDW LQ GRDGHDOUWD X&RHO
LQ DQWL IUDXG PRGHOV 7KHVH PRGHOWRDS D
LGHQWL\ FKDUDFWHULVWLFV RI WKHDFWQXZPLW
IUDXGXOHQW RU VXVSLFLRXV FODLPDLPW ZKD
LGHQWLILHG DV IUDXGXGHYQWORSRBLQ'RIWKH
VHW RI FODLPV LGHQWLILHG DV IUDXGXVHGWDX
DQG FODLP VHWWOHPHQW SUDFWLFH'RQDRO WKH
ELDVHV EDVHG RQ FXOWXUDO EDFNJURXQGV"

%LUQ\ %LUQEDXP

< &HQWHU IRU (FRQRPLF -XVWEDD \$OJRULWKP LQ ,QVXUDQFH -XQH

1\$, & 6X

([DPSOH 3URSHQVLW\ IRU)UDXG

38QVWUXFWXUHG GDWD KDV EHFRRPH DQPRSSRUV
0DQ\ LQVXUHUV KDYFKDQJHHDXEQVWVXFWXUHQ
VWUXFWXUHG GDWD DQG DFWLYHO\ PLOQHEWKL
WKHUHLQ

37KLV >SURSHQVLW\@ PRGHOOHQJ RV HDGQWR
SROLF\ KROGHU WR FRPPLW D IUDXGUXHQWLD
«)UDXG GHWHFWLRQWDFKDWURQ QXUDMGLYH
,QVXUHUV DUH QRZ DEOH WR UXQ SWHQJFWLYH
PXOWLSOH WRXFK\SRVQWDFKHQVZSWHWDIQR
DGGHG 7KLV QRW RQO\ LPSURYHV

%LUQ\ %LUQEDXP

< &HQWHU IRU (FRQRPLF -XVWEDD \$OJRULWMLPV LQ ,QVXUDQFH-XQH

1\$, & 6X

(WKLFD O \$OJRULWKP V
0LQLPL]LQJ 'LVSDUDWH ,PSDFW LQ ,QVXU

2QH 7RRO &RQVLGHU 3URKLELWHG 5LWN &ODV

Step 1: Include race, religion and national origin – or proxies for these characteristics if actual individual characteristic unknown – as independent variables – control variables – in the model.

%LUQ\ %LUQEDXP
< &HQWHU IRU (FRQRPLF -XVWEDB \$OJRULWKP V LQ ,QVXUDQFH -XQH

1\$, & 6X

1HZ <RUN 7LPHV \$XJXO WRULWKPV \$DQG %:LLDWK 4
&\QWKLD 'ZRUN

4 6RPH SHRSOH KDYH DUJXH G WKDW D\OLJROU L
EHFDXVH WKH\ PDNHG HRFQ VLDWQY EDVH RI KX
2WKHUV VD\ DOJRULWKPV UHIOHFW DQGG BHUS
\RX WKLQN"

\$ \$OJRULWKPV GR QRW DXWRPDWLFFDOO\ HO
ELDVHV LQ WKH HDUODHG EZLWK HE DQWRULWKP
GLVFULPLQDWRQ ZLOO OHDG WR IXWXUH GL

)DLUQHVV PHDQV WKDW VLPLODUASHE SHRSOH DU
***understanding of who should be considered similar for a
particular classification task requires knowledge of sensitive
attributes, and removing those attributes from consideration
can introduce unfairness and harm utility.***

%LUQ\ %LUQEDXP

< &HQWHU IRU (FRQRPLF -XVWEDD \$OJRULWKPV LQ ,QVXUDQFH -XQH

1\$, & 6X

4 6KRXOG FRPSXWHULRQLHQFFOXGGXOFDWRQV
DZDUH RI WKHVH LYDULRXV DQG SWKRD FKHV WR
WKHP "

\$ \$EVROXWHO\)LUVW VWXGHQWV WKRXOG
DOJRULWKPV HPERG\ YDOXH MXGJPHQWV DQC
V\ VWHPV RSHUDWH 7KH\ VKRXOG DOWR WOHU

%LUQ\ %LUQEDXP

< &HQWHU IRU (FRQRPLF -XVWEDG \$OJRULWKPV LQ ,QVXUDQFH -XQH

1\$, & 6X

, OOXVWUDWLRQ RI 2QH 7HFKQLTXH WR 0LQL

/HW 1 V FUHDWH D VUHSODFWP RWKHOOVWHSODRGR R

E E E E H \

6D\ WKDW ; DUH PLOHV GULYHQ GULYLQJ UHFRI
ZH DUH WU\LQJ WR SUHGLFW \ ± WKH IUHTXHQF

/HW 1 V DVVXPH WKDW DOO WKUHH HVGDEWRUWDRM
OLNHOLKRRG RI DYFOOXHPVDDUGHWKIRZ P XUFKEHDFHKV ;
WR WKH H[SODQDWLRQ RI FODLP

ELV WKH ³LQWHUFHSW' ± D EDVH DPRXSWUDQOR
RI WKH H[SODQDWLRQVSRWKHGHGLE\ WKH LQGH
YDULDEOHV

%LUQ\ %LUQEDXP

< &HQWHU IRU (FRQRPLF -XVWEDD \$OJRULWMLPV LQ ,QVXUDQFH -XQH

1\$, & 6X

:KDW +DSSHQV :KHQ :H ([SOLFLWO\ &RQVLGHU \$

E E E E H \

5 LV D FRQWURO YDULDEOH ± E\ LQF ~~PHGMQJW~~
FRUUHODWLRQ RI WKH ;V WR UDFH ~~QNZVWYVWXV~~
DUH QRZ WKH FRQWULEXWLRQ RI ~~W~~ ~~HW~~ ~~LR~~ ~~QL~~ ~~WR~~ ~~GH~~
UDFH WR H[SODLQLQJ WKH OLNHOLKRRG RI D F

:KHQ WKH PRGHO LV GHSOR\HG WKH ~~W~~ ~~HL~~ ~~DE~~ ~~OH~~
UHPDLQ EXW WKH E YDOXHV QRZ PLQLPL]H GLV

:K\ LV D 6WDWLVLWLFDO 7HVW IRU 'LVSDUDWH
\$FWXDULDO -XVWLILFDWLRQ 8VHG E\ ,C

\$FWXDULDO MXVWLILFDWLRQ LV DUVFKDWMIDFWLHFU
RI WKH FRQVXPHU YHKLFOH SURSHUMLWRKUDHQY
SDUWLFXODU RXWFRPH OLNH SXUH SHUNDPXP D
VWDWLVLWLFDO WHVW FDQ EH XVHG WLP \$IDW XD
6WDWHG GLIHUHQWO\ ± LI D SDUWLFXODULFRQ
XVHG WR MXVWLI\ VD\ LQVXUDQFH GDHGVWRMF
FRUUHODWLRQ DQGIMFDDQWLVWUFDUHDMRIQDEOH
GLVSDUDWH LPSDFWPDQGVXLRQLRQGWKEUVDHGLV F
IDFWRUU

(WKL FDO \$OJRULWKPV 5HDV RQDEOH DQ
IRU ,QVXUDQFH 3ULFLQJ DQG &ODLPV 6HW

0LQLPLJHV 'LVSDUDWH ,PSDFW ± 6WRS WKH &
+LVWRULFDO 'LVFULPLQDWLRQ

3URPRWHV \$YDLODELOW\ DQG \$IIRUW GDELOW

,PSURYHV &RVW %DVHG ,QVXUDQFH 3ULFLQJ

,PSURYH 3ULFH 6LJQDOV WR ,QVXUPHQW MRU /

+HOS ,GHQWL\ %LDVHV LQ 'DWD DQGLKORVHO

,PSURYH &RQVXPHI &RQULGUHQDFWPHQW E\ ,QV