



\* OREDO & ROORTXLPLQ5HFHQW \$ GYDQFHPHQWDQG (IIHFWD05HVHDFKHVLQ (QJLQHULQJ 6FLHQFHDQG  
 7HFKQRORJ \$5(5(67 .)

6WXGHQWDFDGHPLFSSHUIRUPDQFHSUHGLFWLRQPRGHQXVLQJGHFLVLRQWUHH  
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Departamento de Informática e Ingeniería, Musaliar College of Engineering and Technology, Pathanamthitta, 689653, India

#### \$ EVWUDFW

7KH UHVHDFK RQ WKH HGXFDFLRQDO ILHOG WKDW LQROYHV 'DWD 0LQLQJ WHFKQLTXHV LV UDSLGO \ LQFUHDVLRQJ \$ SSO \ LQJ' DWD 0LQLQJ WHFKQLTXHVLRQDQ HGXFDFLRQDO EDFNJURXQG DUH NQRZQ DV(GXFDWLRQDO'DWD0LQLQJWKDWLDPVWR GLVFRYHU KLGGGHQ NQRZOHGJH DQG SDWWHUQV DERXW VWXGHQWV SHUIRUPDQFH 7KL V ZRUN DLPV WR GHYHORS VWXGHQWV DFDGHPLF SHUIRUPDQFH SUHGLFWLRQ PRGHQ IRU WKH % DFKHORU DQG ODVWHU GHJUH VWXGHQWV LQ & RPSXWHU 6FLHQFH DQG (OHFWURQLFV DQG & RPPXQDFWLRQ VWUHDV XVLQJ WZR VHOHFWHG FODVVILFDWLRQ PHWKRGV 'HFLVLRQ 7UHH DQG XJ] 'HGHWF \$QJRULWKP 3DUDPHWHUV OLNH LQWHUQDO PDUNV VHVVRQDO PDUNV DQG DGPLVLRQ VFRUH ZHUH VHOHFWHG WR FRQGXFW WKLV ZRUN, QWHUQDO PDUNV DUH WKH FRPELQDWLRQ RI DWWHQGDQFH PDUNV DYHURJH PDUNV REWDLQHG IURPWRVHVVRQDOH[DPVDQGDVVLQPHQWPDUNV \$GPLVLRQVFRUHRUGHJUHVVWXGHQWVVLVWKHJLJWHGVFRUHRREWDLQHG IURP WKDQG WKH[DPLQDWLRQPDUNVQGHQWUDQFHPDUNV ,QWKHFDVHRIPDVWHUJ]VGHJUHVVWXGHQWV LWLQFOXGHVGHJUHJH[DPLQDWLRQ PDUNVQGHQWUDQFHPDUNV 5HVXOWDQWVGHGLFWLRQPRGHQFDOHGXVHGHGLQGLV \ VWXGHQWVSHUIRUPDQFHUHDQVXEMHFW 7KHUHE \ WKHOHFWXUHUVFDOFODVVL \ VWXGHQWVQGDGDNDQDQDQ \ DFWLRQWRLPSURYHWHKHLUSHUIRUPDQFH 6 \ VVHPDWLFDSSURDFKHVFDQEHWDNDHQWR LPSURYHWHKHLUSHUIRUPDQFHZLWKWLPH 'XHWHDQ \ SUHGLFWLRQDQVROXWLRQVUHGRQH EHHWWHUHVXOWVFDQEH [SHFWHGLQILQDOH [DPV 6WXGHQWVFDQ YLHZWKHLUDFDGHPLFLQIRUPDWLRQDQG XSGDWHV 5HSXWHGRPSDQLHV KDYLQJDLWH XSZLWKWKHLQVWLWXWLRQDQV VHDUFK

**Palabras clave:** (GXFDWLRQDO'DWD0LQLQJ & ODVVLILFDWLRQ 3UHGLFWLRQ 'HFLVLRQ7UHH 'HGHWF\$QJRULWKP XJ]R]LF

& RUUHVSRQGLQJDXWKRU

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FRXQWULHV DUH JHWWLQJ D VXSHULRU XQGHUVWDQGLQJ RI WKH VLJQLILFDQFH RI KLJKHU HGXFDFWRQ LQ WKHLU GHYHORSHPHQW DQG  
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, Q WKLW ZRUN WZR GDWD PLQLQJ DSSURDFKHV DUH SURSRVHG WR SUHGLFW VWXGHQW\VSUHVIRUPDQFH 3UHGLFWLRQ LV GRQH  
XVLQJ WZR DOJRULWKPV 'HFLVLRQ 7UHH' 7DQG) X]] \ \* HQHWLF \$ OJRULWKP) \* \$ 3UHGLFWLRQ LV FDUULHG RXW ZLWK  
DFDGHPLFUHFUGVDORQJZLWKLQWLDODFDGHPLFLQIRUPDWRQ

7KH UHVW RI WKH WH [W LV RUGHUHG DV IROORZV VHFWRQ ,, SUHVHGHQWEDFNJURXQG VWXG \ DQG UHODWHG ZRUN VHFWRQ ...  
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UHFRUGV 7KLVDP \ EHFDXVHGE \ WKHDVXPSWLRQRILQGHSHQGHQFHUHTXLHGE \ WKHDOJRULWKP) RUJHWWLQJDDFXUDF \ LQ  
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EHLQFUDVHG 5HODWHGVWXGLHVDUH

2.1. Métodos de clasificación

, QDFODVVLILFDWLRQDWDNLV WKHREMHWLYHLVWRDVLJQDSUHGHILQHGHODEHORUFODVVRDUHFRUGEDVHGRQDVHWRINQRZQ  
DDWULEXWHV \$ QLPSRUWDQW IHDWXUH RI D FODVVLILFDWLRQPRGHOLVWKDWLWLW EXLOW E \ SDUW RIWKH GDWD DOVR NQRZQ DVWKH  
WUDLQLQJ VHW ZKLFLVXVHGWRWUDLQWKHPRGHO \$OOWKHDWULEXWHVLQWKH VXEVHWDUHNQRZQ HYHQWKHFDVV \$IWHUWKH  
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FODVVRHEDVVLJQH 7RFDWHJULJHDFURUGLW'7 LWWDUWVUURPWKHURRWRGRHDDQJRHVRQHOHYHGRZQDWDWLPH  
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DFFRUGLQJWRWKHODEHORQWKHODIQRGH 7KHNRZOHGJHUHSUHVHGHQWHEV7EHH[WUDFWDHGDQGSUHVHGHQWGLQWKHIRUPRI  
,)7+(1UXOHV> @

X]]\RJLF )DGGUHVHVDOLFDFWRQVWKDW UHVHPEOH KXPDQ GHFLVLRQPDNLQJZLWKD VNLOWR JHGHUWHH[DFW  
VROXWLRQV IURP FHUWDLQ RU DSSUR [LPDWH LQIRUPDWRQ 7KH XVH RI) / EDVHG WHFKQTXHV LV IRU HLWKHU LPSURYLQJ \* \$  
EHKDYLRXURUPRHOOLQJ \* \$ FRPSRQHQWV WKUHVXOWVREWDLQHGKDYHEHHQFDOOHG) \* \$ X]] \ ILWQHVVILQGLQJ))  
PHFKDQLVPJXLGHVWKH\*\$WKURXJKVHDFKVSDFHEVFRPELQLQJYDULRXVFULWHULD IHDWXUHVWKDWKDYHEHHQGLGHQWLILHGDV

JRYHUQLQJIDFWRUUVIRUWKHIRUPDWLRQRIWKHFOXVWHUV

2.2. Predicción del Rendimiento Académico

\$FDGHPLF UHFRUGVDQGLQLWLDODFDGHPFLQIRUPDWLRQ¶VDUHXVHG IRUSUHGLFWLRQ > @ ,QLWLDODFDGHPFLQIRUPDWLRQ  
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: HLJKWDJH LV JLYHQ IRU HDFK SDUDPHWHU LQ WKUHH FDWHJRULHV OLNH HLJKW IRU PDUNV DQG DERYH ILYH IRU PDUNV LQ  
EHWZHHQ DQG IRUPDUNV DQG EHORZ 7KHWRWDO RIZHLJKWLV FDOFXODWHG DQGWHPHG DV DGPLVVLRQ VFRUH  
\$FDGHPLF UHFRUGVLQFOXGHVHQGDQFH WZRVHVVLQRQDOPDUNV DVLJQPHQWPDUNVDQGLQWHUQDOPDUNV ,QWHUQDOPDUN  
FRPELQDWLRQ RI DYHJDJH PDUNV REWDLQH IURP WZR VHVVLQRQD H [DPV DVLJQPHQW PDUNV DQG DWWHQGDQFH) URP  
SUHGLFWLRQ VWXGHQWVWULVNDQGRW DVLQ> @ WRSDVVDVXEMHFWDUHLGHQWLILHG 7KHUHVXOWVZLOODVVLVWKKHGXFDWLQRQD  
LQVWLWXWLQRVWRPLSURYHWHKH[FHOHQFHFRHWHDFKLQJDIWHUHYDOXDWLQJWKHPDUNVFRUHGEWKHVWXGHQWVLQDQDQDFDGHPLF  
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'DWD VHW LV WKH ZKROH GDWD XVHG IRU PLQLQJ 5HOHYDQW GDWD IRU SUHGLFWLRQ LV FROOHFWHG WKURXJK VFKHGXOHV OLNH  
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WLPH +HUH LW LQFOXGHV DQG VWXGHQWV IURP EDFKHORU DQG PDVWHU GHJUHH SURJUDP UHVSFWLYHO\ \$PRQJ  
VWXGHQWVLWLQFOXGHVWZREDWFKHVI VWXGHQWVIURPGHJUHHFRPSXWHUVFLHQFHHGSDUWPHQWDQGDQRWKHUWZREDWFKHVI  
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PDVWHU¶VFRPSXWHUVFLHQFHDQGWZREDWFKHVI VWXGHQWVIURPPDVWHU¶VHOHFWURQLFVDQGFRRPPXQLFDWLQRQGHSDUWPHQW  
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VHW 6WUDWLILHGVDPOLQLVXVHGWRJHWWKHWDULQLQJVHWDQGWKHUHPDLQLQLVXVHGIRUWHVWLQJ  
)RUPLQLQJSXUSRVH WKHUHOHYDQWDDWULEXWHVDVLQ> @DUHDGPLVVLRQVFRUH DYHJDJHIRUWZRVHVVLQRQDOPDUNVDQGLQ  
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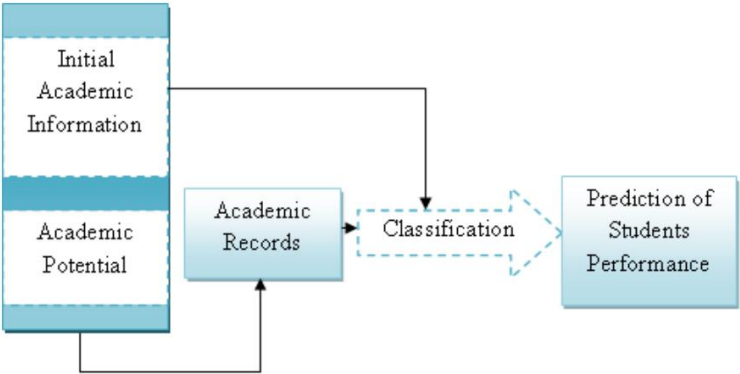
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)LJ 3URSRVHG'DWD0LQLQJ0RGHO

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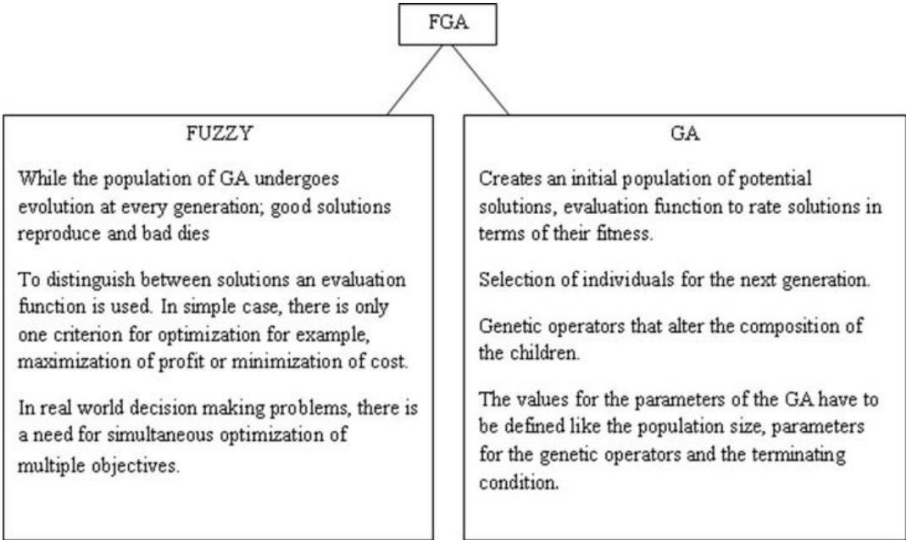
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de '7FODVVLHVLVQVWDQFHVE \ VWDUWLQJRIURPWKHURRWQRGRHRIWKHWHHDQGPRYLQJWRZDUGVWKHOHDIQRGH

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VSOLWWLQJDWWULEXWH6\$ \$ WKHLI6\$ \$ LVGLVFUHHV YDOXHG WKHQRQHEUDQFKLVJURZQIRUHDQNRZQYDOXHRI6\$ \$ LI  
6\$\$LVFRQLQXRV YDOXHG WKHQZREUDQFKVDUHJURZQ FRUHVSRQGLQJWR6\$ \$ VSOLWSRLQWDQG6\$ \$VSOLWSRLQW  
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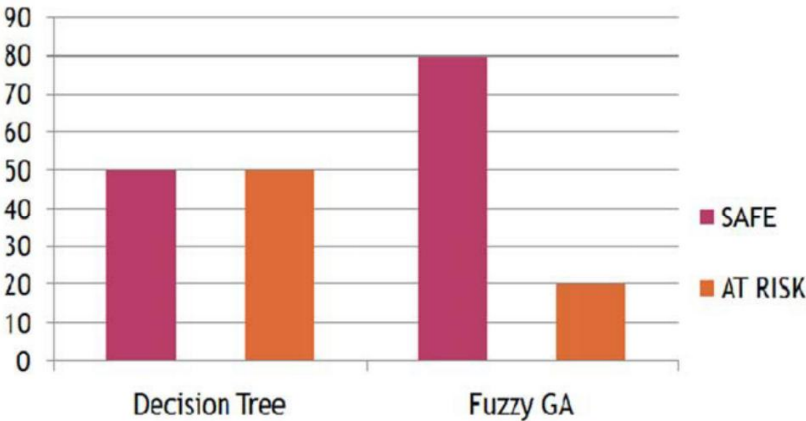
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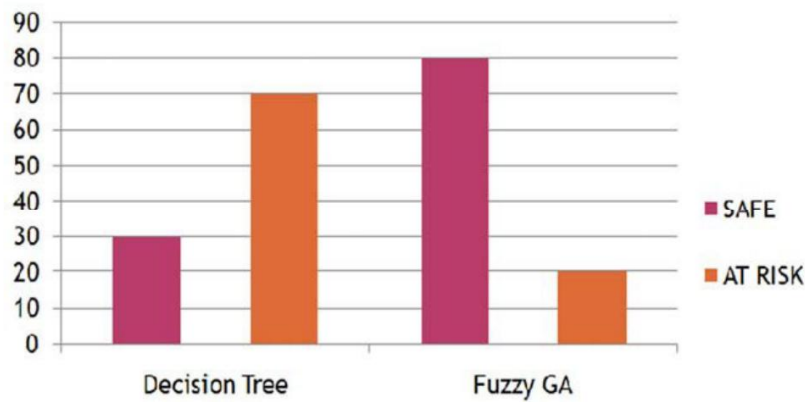
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)LJ 3UHGLFWLRQRIPDWKHPDWLFVUHVXOW



) LJ 3UHGLFWLRQRIELJGDWDUHVXOW

& RQFOXVLRQ

3UHGLFWLRQ RI VWXGHQW¶V DFDGHPLF SHUIRUPDQFH LQ EDFKHORU¶V DQG PDVWHU¶V GHJUHH IRU HDFK VXEMHFW ZDV GRQH LQGHSHQGHQWO\XVLQJGHFLVLRLQWUHHDOJRULWKP DQGIXJ]JHQHFWLFDQJRULWKP 5HVXOWVUIURPGHFLVLRLQWUHHDOJRULWKPDPDGH PRUH VWXGHQWV DW ULVN FODVV ZKLFKPDNHVOHFWXUHV D GHFLVLRLQWRWDNHPRUH FDUH IRUWKRVH VWXGHQWV 7KDW KHOSVWR H[SHFWDEHWWHDDQGDOPRVWFHQWSHUHFHQWUHVXOWVUIURPWKHILQDOH[DPV 5HVXOWVUIURPIXJ]JHQHFWLFDQJRULWKPJLYHPRUH SDVVHG VWXGHQWV EHFDXVHRIRQVLGHULQJWKRVHZKRDUHLQEHWZHHQ ULVNDQG VDIH WR VDIH VWDWHWKDW JLYHV VWXGHQWVD PHQWDO VDWLVIDFWLRQ% XW WKH OHFWXUHV ZLOO WDNH DWWHQWLRQ RQ WKHP LQGLUHFWRU\ 6R D IULHQGO\ HQYLURQPHQW ZLOO EH FUHDWHGLQ EHWZHHQOHFWXUHVUDQG VWXGHQWV \$OVRH[SHUW VWXGHQWVZLOO EH UHFUXLWHG E\ UHSXWHGRPSDQLHVWKDWDPNH VWXGHQW¶V VIXWXUHVHFXUH 6WXGHQW¶V VHDUO\UHFUXLWPHQWWRFRPSDQLHVEULQJVERWKWKHLQVWLWXWLRQDQG VWXGHQWVWRSUHVWLJH

5HIHQFHV

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- > @%DUDGZDM% . 3DO 6 0LQLQJHGXFDFWLRQDQGDWDWRDQDOJ]HVWVXGHQWV SHUIRUPDQFH DU;LYSUHSULQWDU;LY
- > @ 0D]] RQL 7KH & OLTXH3DUWLFLSDWLRQ, QGH [ & 3, DVDQLQGLFDWRURIFUHDWLYLW \ LQRQOLQHFRORDERUDWLYHJURXS -RXUQDORI & RJQLWLYH (GXFDFWLRQDQGD3VFKRORJ)
- > @/RSHJ\*XDULQ & (\*XPDQ (/ \*RQ]DOHJ) \$ \$ 0RGHWR3UHGLFW / RZ \$ FDGHPLF3HUIRUPDQFHDWD6SHFLILF (QUROOPHQW 8VLQJDWD0LQLQJ 7HFQRORJLDVGHOS\$UHQGLJ]DMH ,(((5HYLVWD,EHURDPHULFDQDGH
- > @2JXQGH \$ 2 \$ MLEDGH ' \$ 'DWD0LQLQJ6 \ VWHPIRU3UHGLFWLQJ8QLYHUVLW \ 6WXGHQW¶V \* UDGDWLRQ \* UDGHV8VLQJ,'HFLVLRLQ 7UHH \$ OJRULWKP -RXUQDORI & RPSXWHU6FLHQFHDQG, QIRUPDWLRQ7HFKRORJ \
- > @ \$GHOPDQ & \$ QVZHUVLQWKH7RRO% R [\$ FDGHPLF, QWHQVLW \ \$ WWHQGDQFH3DWWHUQV DQG% DFKHORU V'HJUHH \$ WWDLQPHQW
- > @6ZDP\ 0 1 +DQXPDQWKDSSD 0 3UHGLFWLQJDQFDGHPLFVXFFHVUIURPVVXGHQWQHURPHQWGDWDXVLQJGHFLVLRLQWUHHWHFKQLTXH, QW - \$ SSO, QI 6 \ VW
- > @ 5DPHVK 9 3DUNDYL 3 5DPDU. 3UHGLFWLQJVXGHQWSHUIRUPDQFH DVWDWLVLWLFDOQGGDWDPLQLQJDSSURDFK ,QWHUQDWLRQDO-RXUQDORI &RPSXWHU\$SSOLFDFWLRQV
- > @ 4XLQODQ - 5 , QGXFWLRQRIGHFLVLRLQWUHHV 0DFKLQHOHDDUQLQJ
- > @ /DNVKPL 7 0 0DUWLQ \$ 9HQDNWHVDQ 9 3 \$ Q \$ QDO \ VL R 1 6WXGHQWV 3HUIRUPDQFH 8VLQJ \* HQHWLF \$ OJRULWKP -RXUQDO RI &RPSXWHU6FLHQFHV DQG\$SSOLFDFWLRQV