



Skin Movement Rules Relative to Joint Motions

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+ HDOWK &DUH 6FLHQWFH *UDGXDWLH 6FKRRO %XQNR *DNXLQ 8QLYHUVLW\ 7RN\R -DSDQ

Corresponding Author 7VXWRPX)XNXL +HDOWK &DUH 6FLHQFH *UDGXDWL 6FKRRO %XQNR *DNXLQ 8QLYH
IXNXL#EJX DF MS

Rec date: \$ S U **Acc date:** 0 D \ **RuB date:**

Copyright: ()XNL 7 HW DO 7KLV LV DQ RSHQ DFFHVV DUWLFOH GLVWULEXWHG XQGHU WKH WHUPV RI XVH GLVWULEXWLRQ DQG UHSURGXFWLRQ LQ DQ\ PHGLXP SURYLGHG WKH RULJLQDO DXWKRU DQG VRXL

/ H W W H U W R (G L W R U

,W KDV EHHQ REVHUYHG IRU D ORQQJ SHULRG WKDW LQ DQDO\WLFDO UHVHDUFK
' PRWLRQ WKH ORFDWLRLQ RI PDUNHUV SODFHG RQ WKH VNLQ GRHV QRW
FRLQFLGH ZLWK WKH ORFDWLRLQ FRDIOXQGHQDOV NQO ERQHV
PRYHPHQW DUWLVRWLV \$ BRUWLIDFW 6 WKH KMRQH QDWD XKHQ ERQHV PRYH WRZDUG
JUHDWHU HUURUV WKDQ LQ VGVWUHVUDQFH DSDURFDOV LQ VOLGHV DWXGLURP VV
S WKH RSSRVLWH VLGH VOLGHV LQ WKH GLU
VOLGHV LQ WKH VDPH GLUHEFWIRQ DV WKH

5XOH6N LQ VOLQXISWURBWBODO OD\HUV * XL
LQ~XHQNFLHQ WHQVLRQ OLQHV ZLOO FKDQJH
XQHUO\LQJ VVWU\XQWXXHUQFRYQURHIQHVE\

5XO H:LWK HYHU\ ERG\ PRYHPHQW VRPH D
DQG RWKHUV DUH ORRVHQHG

\$FFRUGLQQJ WR SK\VL RORJLFDO VNLQ PF
VRPH PHWKRG \$LFVPHWKHUH VRHOK HUV

3ULQFLSOH RI JXLGLQJ VNLQ FUHDVHV
GLUHFWRQ DZD\ IURP WKH VNLQ FUHDVHV
JXLGLQJ LW LQ WKH GLUHFWRQ RI WKH VM

UHVHQFH RI OLQHDU 60\$KLVRQWKKH\QDQWRIORXW SURPL DQ FRUUHODWLRQ ZLWK MRLQW URWDWLQLEOH GXULQJ VNLQ PRYHPHQW ORR

: H WKRXJKW WKHVH GHQHLDWKIOV\$OLWLGHQH RPLQHQDFH ZLOO LQFUHDVH PRELOLW
RYHU ERQHV 6LPXOWDQHRXVO\ ZH ZHSHURBQHULQFH WZLQDQWQWRKHWVRRYQHPRWWRQ RI
WKH FRQWUDODWHUDO VLGH DV D VVWHP BUEFQALQH XRP JXQGLQH VWDOQGLQVSH
VZD\ PRWLRQ WKH IURQW VNLQ RI WKH WKLYKLQDWLDQWDLUQHGXSRUGDZKLGJH
WKH EDFN VNLQ ZDV WUDQVIHUHG GRZQZDUG GXULQH[WDPHPLWQHVSHQBLF VGDGHLDQWHLURUC
2SSRVLWH VNLQ PRYHPHQWV ZHUV REVHUVQHG SXXQHQHSLRMWVWWDQHFRQWLFWKZWVKH
6LPLDUO\ WKH ODWHUDO VNLQ ZDV WUDQVIHUHG GRZQZDUG GXULQH[WDPHPLWQHVSHQBLF VGDGHLDQWHLURUC
ZDV WUDQVIHUHG GRZQZDUG GXULQH[WDPHPLWQHVSHQBLF VGDGHLDQWHLURUC
PO LE`•HUP@§0PGHUð`LPS GLUHEWLRQV *XIGLOI WKH VNLQ IQ BOH

P R Y H P D I Q H F W M R G Q W P R Y H P H Q W (O D V W L F Z K L O H J X L G L Q J L W L Q W K H R W K H U G L U H F W
P W D S L Q J Q L V R Q H R I W K H E H V W
3 U L Q F L S O H R I P X V F O H I D F L O L W D W L R C

H W K R G V W R D S S O \ W K H V K H D U L Q J I R P X F A F W R M R Q W U D F W R R Q G Z K N H U H D Y K J P B L C
la-•W R Z D U G V N L Q O R R V H Q L Q J Z L Q Q I Q E N H D V H U U U E W L B C B L W K H L O V V V V W L B C Z L Q

WLQ VXUIDFH RQ WKH \$7) OLJDPHQW LQ WKH OLJDPHQW ZLOO LQFUHDVH DQNOH S WHQVLRQVORIBGQLTXH VKRXOG EH DSSOLH L@ VWDWH RI VWUHWFKHG VNLQ ,Q WKLV HODVWLF WDSLQJ RU GLUHFWRQDO PDQX DEOH WR NHHS WKH VNLQ VWUHWFKHG RU 5XYQLERUSXVFQHV ZKLFK DUH VORZ WKDYLQJ VORZ DGD\$WHNASSWRS.HHWDMWLF V

VD\ WKDW VNLQ KDV WKH FDSDELOLW\ RI NQRZLQJ LWV ORFDWLRQ UHODWLYH WI
ERQH DV D FRQWLQXLW\ V\VWHP

:H H[SHFW WKDW VNLQ DV DQ HFWRGHUPDO V\VWHP ZLOO EH XVHIXO LQ D
YDULHW\ RI PXVFXORVNHOHWDO GLVHDVHV LQ WKH QHDU IXWXUH

5HIHUGHQFHV

/HDUGLQL