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=KHQK&D&XQF +DQ

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,QWURGXFWRQ

'LJLWDO DUFKLW HFWXUH

GHYHORS PHQW

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IHUWLOLJDWLRQ FROODERUDWLYH L Q Q R Y D W L R Q D Q G V K D U L Q J R I \  
UHVRXUFHV 7RGD\ WKH GHYHORS PHQW RI Q H Z O L E H U D O B U W V \  
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:RUN FDPS PRGH LV D WHDFKLQJ PRGH EDVHG RQ  
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EDVHG RQ WKH ZRUN FDPS PRGH DQG SXW IRUZDUG D  
VFLHQWLILF DQG B U F K W L M F W G L W H W D O H Q W W U D L Q L Q J \  
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WUDGLWLRQDO LQVXVWUWV WKH\ WGHQ DQGR OHW\ D QP RZRUHQ  
SURJUDP LV FHQWHUHG RQ D VSHFL\QGHU DQGR OHW\ D QP RZRUHQ  
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RXW VXEMHFW W\SHV DQGR OHW\ D QP RZRUHQ DQGR OHW\ D QP RZRUHQ  
LQQR\DWLRQ ZLWK WKH\ RUXRQW\ W\SHV DQGR OHW\ D QP RZRUHQ  
GXUDWLRQ RI WKH FDPS LV UHODWLY\ W\SHV DQGR OHW\ D QP RZRUHQ  
EXW LW LV UHOHYDQW HILFLHQW W\SHV DQGR OHW\ D QP RZRUHQ  
6WXGHQWV VHHN WR LQQR\DW\ DQGR OHW\ D QP RZRUHQ  
KDQGV RQ LQVWUXFWLRQ OHDU DQGR OHW\ D QP RZRUHQ  
DFWLYHO\ H[SORULQJ VROXWLRQV DQGR OHW\ D QP RZRUHQ  
SUDFWLFH RULHQW\ DQGR OHW\ D QP RZRUHQ W\SHV DQGR OHW\ D QP RZRUHQ  
VWXGHQWV DELOLW\ WR SUDFWLFH W\SHV DQGR OHW\ D QP RZRUHQ  
WHDPV 7KURXJK WKH\ W\SHV DQGR OHW\ D QP RZRUHQ  
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:RUN FDPS PRGH LQ LQGLYLGXDO DELOLWLHV DUFKLVHFWXUH WDOHQWV ED  
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\* > @ (DFK WHDP KDV D OHDGHU UHVSQVLEOH IRU  
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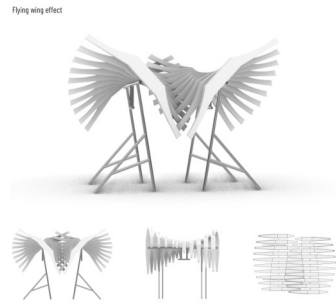
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RHVV

&DVH VWXGLHV

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HVWDEOLVKPHQW RI D GLJLWDO DUFKLWHFWXUH SUDFWLFH  
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DUP GLJLWDO FUHDWLRQ RI WKH LQWHUQDWLRQDO ZRUN FDPV WR  
RQOLQH DQG RIIOLQH ZD\ WR FDUWLQJ WKH SURFHVWV RI QLYHUVLW\  
WKH GLJLWDO SURJUDP GHVLJQ FDUWLQJ WKH SURFHVWV RI QLYHUVLW\  
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)LJ ,Q WKH ZRUN FDPV VWXGHQWV FDUWLQJ WKH SURFHVWV RI QLYHUVLW\  
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RI WKH ZRUN FDPV

Fig. 2. %HMLLQJ 5RERWU\DPW\LRQV DQG FRQVWUXFWLRQ  
,QWHOOLJHQW DQG RIIOLQH ZD\ WR FDUWLQJ WKH SURFHVWV RI QLYHUVLW\  
6WUXFWXUH &RQVWUXFWLRQ 3UR



Beijing Robotic Arm Digital Construction Work Camp  
Learned the cutting and processing process of polyurethane large scale EPS foam, and the whole digital construction process of hot wire building components was done by me.  
-Solved the EPS positioning problem, how to measure the spatial position by the hot wire of the hot wire cutting head, so that the component production quality is higher.  
-Learned to master the different speed and temperature control, how to quickly cut EPS and reduce the loss of heating wire, in the later program has been maintained stable cutting 20 pieces.  
-Under the hot wire cutting trajectory planning, I found that the previous large body of fast EPS foam is easy to hit the tool head, so I made a collision detection algorithm, the foam is cut in steps to complete, while the path is also compared to the previous is the shortest, which is also learning hot wire cutting process is an improvement.

Fig. 1. %HMLLQJ 5RERWU\DPW\LRQV DQG FRQVWUXFWLRQ  
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'SULQWLQJ DQG RWKHU LQWHOOLJHQW ZRUN FDUWLQJ WKH SURFHVWV RI QLYHUVLW\  
'LJLWDO 'HVLJQ 6FKHPH

%HMLLQJ 5RERWU\DPW\LRQV DQG FRQVWUXFWLRQ  
,QWHOOLJHQW DQG RIIOLQH ZD\ WR FDUWLQJ WKH SURFHVWV RI QLYHUVLW\  
6WUXFWXUH &RQVWUXFWLRQ 3UR  
7DNH %HMLLQJ &LW\ 8QLYHUVLW\ DV DQ H[DPSOH WKH VFKRRO  
DQG WKH %HMLLQJ OXQLFLSDO ,QVW\XWH RI \$UFKLWHFWXUD  
'HVLJQ HVWDEOLVKHG D VWUD\WHLF SDUWLFLSDO WKH  
HVWDEOLVKPHQW RI D GLJLWDO DUFKLWHFWXUH SUDFWLFH  
LQ FRRSHUDWLRQ KHOG WKH QLYHUVLW\ PHFKDQLFDO  
DUP GLJLWDO FUHDWLRQ RI WKH LQWHUQDWLRQDO ZRUN FDPV WR  
RQOLQH DQG RIIOLQH ZD\ WR FDUWLQJ WKH SURFHVWV RI QLYHUVLW\  
WKH GLJLWDO SURJUDP GHVLJQ FDUWLQJ WKH SURFHVWV RI QLYHUVLW\  
LQ VPDOO JURXS GLJLWDO PRGH QLYHUVLW\ WKH SURFHVWV RI QLYHUVLW\  
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FDPV VWXGHQWV ZRUNHG LQ VPDOO JURXS DQG FDUWLQJ WKH SURFHVWV RI QLYHUVLW\  
WKUHH SKIVLFDQ FRQVWUXFWLRQ FDUWLQJ WKH SURFHVWV RI QLYHUVLW\  
'SULQWLQJ DQG RWKHU LQWHOOLJHQW ZRUN FDUWLQJ WKH SURFHVWV RI QLYHUVLW\  
)LJ ,Q WKH ZRUN FDPV VWXGHQWV FDUWLQJ WKH SURFHVWV RI QLYHUVLW\  
ZKROH SURFHVV RI SDUDPHWULF FDUWLQJ WKH SURFHVWV RI QLYHUVLW\  
H[SHULHQFH VR WKDW VWXGHQWV FDUWLQJ WKH SURFHVWV RI QLYHUVLW\  
GLJLWDO FRQVWUXFWLRQ DQG FDUWLQJ WKH SURFHVWV RI QLYHUVLW\  
SURPRWLQJ WKH FXOWLYDWLRQ FDUWLQJ WKH SURFHVWV RI QLYHUVLW\  
DFWLYLW\ LV D SRVLWLYH DQG FDUWLQJ WKH SURFHVWV RI QLYHUVLW\  
FXOWLYDWLRQ RI GLJLWDO DUFKLWHFWXUH FDUWLQJ WKH SURFHVWV RI QLYHUVLW\  
RI WKH ZRUN FDPV  
&RQVWUXFWLRQV DQG RXWORRN  
'LJLWDO DUFKLWHFWXUH LV D WUHQQ  
WRGD\ V FRQVWUXFWLRQ LQGXVWU\  
'HOLEHUDWLRQ RI 5RERWU\DPW\LRQV DQG FRQVWUXFWLRQ H[DPSOH  
PRGH SURYLGHV D VFLHQWLILF DQG  
IRU WKH FXOWLYDWLRQ RI GLJLWDO

FXOWLYDWHV VWXGHQWV GLJLWDO VNLOOV DQG SUDFWLFD O H[SHULH  
WKURXJK SUDFWLFD RSHUDWLRQ DQG WHDPZRUN 7KURXJK FDVH  
VWXG\ DQG UHVHDFK WKLW SDSHU SURSRVHV D VHW RI GLJLWDO  
DUFKLWHFWXUH WDOHQW FXOWLYDWLRQ VWUDWHJLHV EDVHG RQ WK  
ZRUN FDPS PRGHO ZKLFK SURYLGHV QHZ LGHDV DQG  
PHWKRGV IRU GLJLWDO DUFKLWHFWXUH WDOHQW FXOWLYDWLRQ ,Q W  
IXWXUH WKH HFWXUDRQ DQG DFWLRQ FDQ IXUWKHU  
GHHSHQ WKH ZRUN FDPS PRGH DQG H[SORUH PRUH GLJLWDO  
DUFKLWHFWXUH WDOHQW FXOWLYDWLRQ PRGHV WR DGDSW WR WKH  
GHYHORSPHQW RI GLJLWDO DUFKLWHFWXUH

## \$FNQRZOHGJPHQWV

7KLV SDSHU LV RQH RI WKH SKDVHG DFKLHYHPPHQWV RI WKH  
HGXFDFWLRQDO VFLHQFH UHVHDFK SURMHFW RI %HLMLQJ &LW\  
8QLYHUVLW\ 5HVHDFK RQ WKH &XOWLYDWLRQ RI 'LJLWDO  
\$UFKLWHFWXUH 7DOHQWV EDVHG RQ WKH :RUN FDPS ORGHO  
-<&

## 5HIHUUHQFHV

%URZQ 7 :\DWW - 'HVLJQ 7KLQNLQJ IRU  
6RFLDO ,QQRYDWLRQ 6WDQGIRUG 6RFLDO ,QQRYDWLRQ  
5HYLHZ  
:HL =/ 5HVHDFK RQ 3UDFWLFD 7HDFKLQJ RI  
\$UFKLWHFWXUDO \$UW DQG 'HVLJQ :RUN &DPS 7DNLQJ  
WKH &KLQD ,QGRQHVLD \$UFKLWHFWXUDO 'HVLJQ -RLQW  
3UDFWLFH :RUN &DPS DV DQ ([DPSOH 6FLHQFH DQG  
(GXFDWLRQ \*XLGH  
)DEULV 0 ) / \*UDQHOOR \* 7KH 5RXWOHGJH  
+DQGERRN RI 7HDFKLQJ /DQGVFDSH 5RXWOHGJH  
/RQGRQ  
<DNPDQ \* 67(\$ LV )XQFWLRQDO /HQUQLQJ  
KWWV VWHDPHGX FRP DERXW XV VWXGHQWV  
7DQJ / /LQ 3 ([SORUDWLRQ RI SUDFWLFD  
HGXFDFWLRQ PRGHOV LQ DSSOLHG ORFDO XQLYHUVLWLHV  
(GXFDWLRQ 2EVHUYDWLRQ