

1 2 3

- 1. 116024
- 2. 430072
- 3. 201100

1

10 0

10

1

2

3

10

4

2

2.1

1 $\frac{1}{2}$
4 $\frac{1}{2}$

2 $\frac{1}{2}$
5 $\frac{1}{2}$
A = Strait

B = Pike

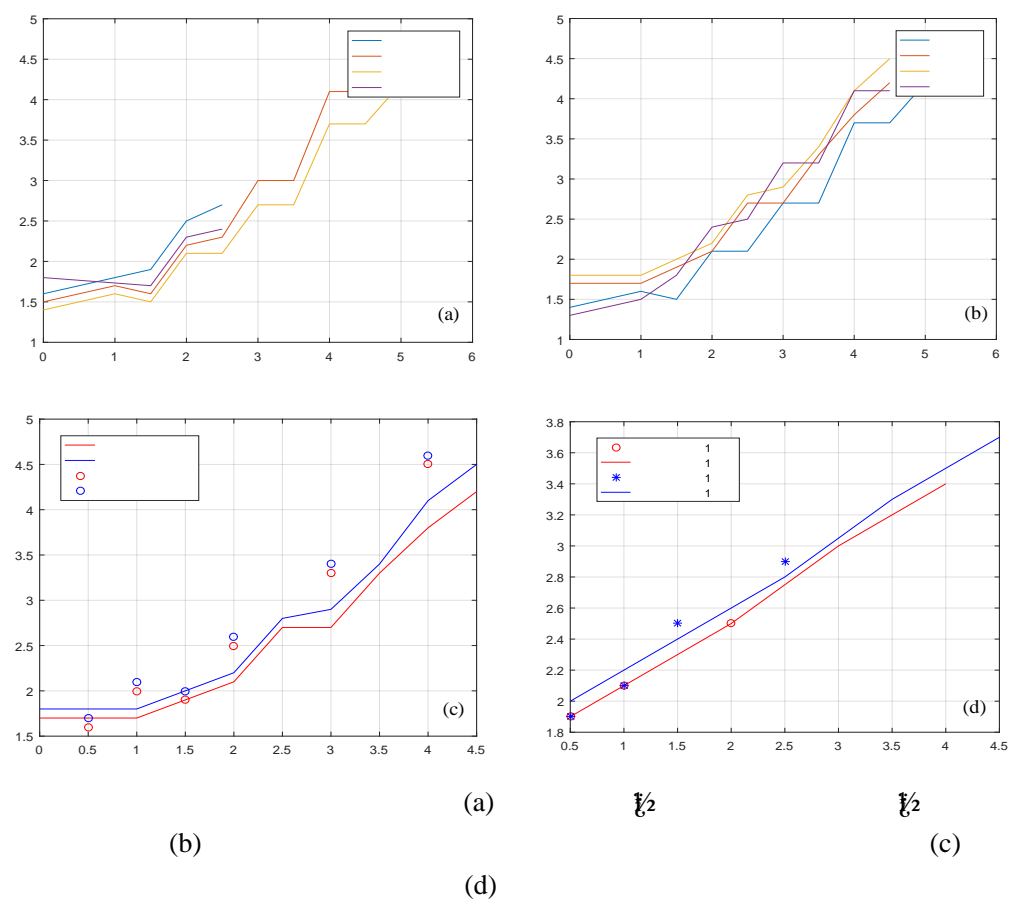
6 $\frac{1}{2}$ 3 $\frac{1}{2}$
C = Tuck

D = Free

E = Fly
 1 / /
 2 3 4
 5

Forward Group
 " " > > "
 1(a)

1(b)



1 (b) (a) 1/2 1/2 (c)
 2 2
 1(c)

1(d)

[7]

DD=A+B+C+D+E

$$y = x_1 + x_2 + x_3 + x_4$$

$$DD = A + B + C + D + E$$

$$x_1 \quad x_2 \quad x_3 \quad x_4$$

	1	x_1	x_2	x_3	x_4		
		x_1		x_2		x_3	x_4
0	0	D	0	0.5	0	FWD	0
0.5	0.0909	C	0.1667	1	0.125	BACK	0.2564
1	0.1818	B	0.3333	1.5	0.25	REV	0.3846
1.5	0.2727	E+C	0.35	2	0.375	INW	0.1667
2	0.3636	A	0.9333	2.5	0.5	TWI+ FWD	0.6667
2.5	0.4545	E+B	1	3	0.625	TWI+ BACK	0.6923
3	0.5455			3.5	0.75	TWI+ REV	0.8077
3.5	0.6364			4	0.875	TWI+ INW	0.5385
4	0.7273			4.5	1	ARM+ FWD	0.4103
4.5	0.8182					ARM+ BACK	0.6410
5.5	1					ARM+ REV	0.6795
						ARM+FWD+TWI	0.8974
						ARM+BACK+TWI	1

$$y = 0.8803 + 0.6747x_1 + 1.6462x_2 + 0.2753x_3 + 0.0076x_4$$

$$R^2=0.907$$

2.2

[6]

$$J = \sum_i m_i r_i^2$$

$$m_i \quad r_i \quad i$$

$$J = M$$

$$2-(n-\frac{1}{2})t_3-\frac{Mt_0t_3}{0.033mt^2} \tag{12}$$

$$n \qquad t_3$$

$$t_3=0.066(n-\frac{1}{2})\frac{mh^2}{Mt_0} \tag{13}$$

$$2 \qquad 4$$

$$2$$

$$\frac{4}{2} \qquad 1/4 \qquad t_2=t_4 \qquad 2 \qquad 0$$

$$J_2(t)=[0.053-(0.053-0.033)\frac{t}{t_2}]mh^2 \tag{14}$$

$$J_2(t)-J_2(t)-J_3 \tag{15}$$

$$0.053-0.02\frac{t}{t_2}mh^2 \qquad J_2(t)=0.033mh^2 \tag{16}$$

$$J_2(t)=\frac{0.033t_2}{0.053t_2-0.02t} \tag{17}$$

$$'' \qquad '' \qquad 3 \qquad \frac{t}{2} \qquad 1/4 \qquad t=t_2$$

$$\int_0^{t_2} J_2(t)dt = \frac{1}{4} \tag{18}$$

$$1.65t_2\ln\frac{0.053}{0.033t_3}-\ln\frac{1}{t_3}-\frac{1}{2} \tag{19}$$

$$3-\frac{Mt_0}{0.033mh^2}$$

$$t_2-t_4-\frac{0.067mh^2}{Mt_0} \tag{20}$$

$$n$$

$$t-t_2-t_3-t_4-0.066(n-\frac{1}{2})\frac{mh^2}{Mt_0}-\frac{0.134mh^2}{Mt_0} \tag{21}$$

$$\frac{1}{2} \qquad \frac{1}{2} \qquad \frac{1}{2} \qquad 5 \qquad \frac{1}{2} \qquad \frac{1}{2} \qquad \frac{1}{2} \qquad \frac{1}{2} \qquad \frac{1}{2} \qquad \frac{1}{2} \qquad n$$

$$t=0.042(n-\frac{1}{2})\frac{mh^2}{Mt_0}-0.108\frac{mh^2}{Mt_0} \tag{22}$$

$$'' \qquad > \qquad > \qquad ''$$

2.2.3

[4]

5

[5]

J_y

$J_x \quad J$

J_x

J_y

11.3

[1]

$$J_y = 0.0047mh^2$$

23

1

5

3

[2]

$$J_y = \frac{J_{xy}}{J_x J_y} J_{xy}^2 J_x^0 J_y^0$$

24

$J_x^0 J_x^0$

$J_x^0 J_x^0$

$J_x^0 J_x^0 = Mt_0$

J_{xy}

y

3

[2]

$$J_y = \frac{3Mt_0}{0.053mh^2}$$

25

$n\frac{1}{2}$

3

t_3

2 n'

$t_3 = t_3$

26

$$t_3 = 0.353n' \frac{mh^2}{Mt_0}$$

27

2 3

3 4

1/4

$t_2 = t_3$

$$(0.053 - 0.0483 \frac{t}{t_2})mh^2 = 0.0047mh^2$$

28

$$t_2(t) = \frac{0.0047 t_2}{0.053t_2 - 0.0483t}$$

29

$t=t_2$

2

1/4

$$\int_0^{t_2} t_2(t) dt = 2(n-1) \frac{1}{4}$$

30

25

29

$$t_2 = t_3 = 0.0375(n-1) \frac{mh^2}{Mt_0}$$

31

n

$$t \quad t_2 \quad t_{2 \ 3} \quad t_3 \quad t_{3 \ 4} \quad t_4 \quad 0.353n' \frac{mh^2}{Mt_0} \quad (0.855n \quad 0.749) \frac{mh^2}{Mt_0} \quad 32$$

3

2.3

[3]

2

BMI

$$\text{BMI} = \text{kg} \frac{1}{\text{m}^2} \quad 33$$

18.5-23.9

2

/	cm			kg		
	170	177	163	62	74	49
	160	167	153	54	66	43

DD

$$\text{DD} = \text{A} + \text{B} + \text{C} + \text{D} + \text{E} + \text{F}$$

" "

0

n

$$t \quad 0.042(n \quad \frac{1}{2}) \frac{mh^2}{Mt_0} \quad 0.108 \frac{mh^2}{Mt_0} \quad 34$$

M

t₀

307½

3 ½ 309½

4 ½

APPENDIX 3

3

Dive	Pos	Hght	A	B	C	D	E	DD
307	C	10	2.7	0.0	0.0	0.3	0.4	3.4
309	C	10	3.5	0.3	0.0	0.3	0.4	4.5

h=1.70 m=62.0

307 ½

3 $\frac{1}{2}$ 1 $n=3.5$

$$\int_0^{t_0} M dt = 90.31 \qquad 35$$

307 307 309 2(a)

2(b) F

_____ - 36

$$z=0.4$$

(a)

(b)

2 (a) 307

(b) 309

3

4 1.67m 53kg 1

2 PIKE

TUCK 3

105 107 109 1011

4 205 5255 207 5275

54kg 1.67m 1.60m 53kg

	PIKE			TUCK		
	B	B		C	C	
105	2.3	2.05-2.61	2.36	2.1	1.87-2.38	2.16
107	3.0	2.67-3.40	3.08	2.7	2.41-3.06	2.77
109	4.1	3.65-4.64	4.21	3.7	3.30-4.19	3.80
1011	--	--	--	4.7	4.19-5.32	4.83
205	2.9	2.58-3.28	2.98	2.7	2.41-3.06	2.77
207	3.6	3.21-4.08	3.70	3.3	2.94-3.74	3.39
209	4.5	4.01-5.10	4.62	4.2	3.74-4.76	4.32
5255	3.6	3.18-4.09	3.71	3.4	3.00-3.86	3.50
5257	4.1	3.61-4.66	4.23	3.9	3.45-4.43	4.02
5273	3.8	3.36-4.31	3.92	3.5	3.09-3.97	3.61
5275	4.2	3.70-4.78	4.34	3.9	3.45-4.43	4.02

4

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Model and Analysis for Body Shape Correction Coefficient of Platform Diving

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Abstract: Aiming at the influence of athletes' body shape on the completion time of platform diving, a new calculation method of body shape correction coefficient was proposed based on the original calculation rules of diving difficulty coefficient. Firstly, the main factors affecting the difficulty coefficient were analyzed, and the multivariate linear regression model between the difficulty coefficient and the influencing factors was established. Then, based on the moment of momentum theorem and conservation principle of angular momentum, diving actions were classified and analyzed respectively, and the dynamic equation of the human body moving around the rotation axis was established. The relationship between the time to complete each diving action and the athlete's body shape was obtained. Finally, a model for calculating the body shape correction coefficient was established to correct the original difficulty coefficient. The corrected difficulty coefficient can reflect the true difficulty of diving action of athletes with different body types more accurately under the condition of certain rationality.

Keywords: data analysis; multiple linear regression; conservation of angular momentum; shape correction coefficient