**itch\_training Description**

Reinforcement learning based on the BabyBench environment is implemented with intrinsic motivation. The baby's body produces an itch at random, and the agent learns to quickly touch the itch.

Training process:

Each step detects whether the itch is touched

Touch success: +1 reward is given, a new itch is generated, and the body schema is updated

Touch failure: reward is 0

PPO algorithm learns touch strategy

Output results:

Save training model (itch\_touch\_model.zip)

Generate body schema visualization (body\_schema.png)

Output

C:\Users\Administrator\BabyBench2025\_Starter\_Kit>python itch\_training.py

传感器总数: 5723

身体部位: [23, 19, 22, 18, 21, 17, 20, 16, 2, 3, 4, 5, 12, 8, 13, 9, 14, 10, 15, 11]

新瘙痒部位: 13

初始身体图式: {23: 0, 19: 0, 22: 0, 18: 0, 21: 0, 17: 0, 20: 0, 16: 0, 2: 0, 3: 0, 4: 0, 5: 0, 12: 0, 8: 0, 13: 0, 9: 0, 14: 0, 10: 0, 15: 0, 11: 0}

Using cpu device

新瘙痒部位: 15

新瘙痒部位: 2

新瘙痒部位: 10

新瘙痒部位: 14

新瘙痒部位: 8

新瘙痒部位: 13

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| time/ | |

| fps | 64 |

| iterations | 1 |

| time\_elapsed | 15 |

| total\_timesteps | 1024 |

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新瘙痒部位: 15

新瘙痒部位: 19

新瘙痒部位: 10

新瘙痒部位: 17

新瘙痒部位: 9

新瘙痒部位: 22

新瘙痒部位: 3

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| time/ | |

| fps | 50 |

| iterations | 2 |

| time\_elapsed | 40 |

| total\_timesteps | 2048 |

| train/ | |

| approx\_kl | 0.06873426 |

| clip\_fraction | 0.507 |

| clip\_range | 0.2 |

| entropy\_loss | -42.6 |

| explained\_variance | -7.0903263 |

| learning\_rate | 0.0003 |

| loss | -0.568 |

| n\_updates | 10 |

| policy\_gradient\_loss | -0.111 |

| std | 1 |

| value\_loss | 0.0246 |

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新瘙痒部位: 10

新瘙痒部位: 3

新瘙痒部位: 21

新瘙痒部位: 18

新瘙痒部位: 14

新瘙痒部位: 16

新瘙痒部位: 8

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| time/ | |

| fps | 50 |

| iterations | 3 |

| time\_elapsed | 60 |

| total\_timesteps | 3072 |

| train/ | |

| approx\_kl | 0.083302364 |

| clip\_fraction | 0.555 |

| clip\_range | 0.2 |

| entropy\_loss | -42.8 |

| explained\_variance | -0.60600126 |

| learning\_rate | 0.0003 |

| loss | -0.567 |

| n\_updates | 20 |

| policy\_gradient\_loss | -0.102 |

| std | 1.01 |

| value\_loss | 0.0203 |

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新瘙痒部位: 10

新瘙痒部位: 16

新瘙痒部位: 5

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| time/ | |

| fps | 52 |

| iterations | 4 |

| time\_elapsed | 78 |

| total\_timesteps | 4096 |

| train/ | |

| approx\_kl | 0.09058524 |

| clip\_fraction | 0.575 |

| clip\_range | 0.2 |

| entropy\_loss | -43 |

| explained\_variance | -0.28891706 |

| learning\_rate | 0.0003 |

| loss | -0.542 |

| n\_updates | 30 |

| policy\_gradient\_loss | -0.094 |

| std | 1.02 |

| value\_loss | 0.0289 |

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新瘙痒部位: 20

新瘙痒部位: 22

新瘙痒部位: 3

新瘙痒部位: 22

新瘙痒部位: 3

新瘙痒部位: 19

新瘙痒部位: 22

新瘙痒部位: 22

新瘙痒部位: 22

新瘙痒部位: 16

新瘙痒部位: 2

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| time/ | |

| fps | 54 |

| iterations | 5 |

| time\_elapsed | 93 |

| total\_timesteps | 5120 |

| train/ | |

| approx\_kl | 0.099337816 |

| clip\_fraction | 0.601 |

| clip\_range | 0.2 |

| entropy\_loss | -43.2 |

| explained\_variance | -4.5304346 |

| learning\_rate | 0.0003 |

| loss | -0.574 |

| n\_updates | 40 |

| policy\_gradient\_loss | -0.12 |

| std | 1.03 |

| value\_loss | 0.00813 |

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新瘙痒部位: 20

新瘙痒部位: 10

新瘙痒部位: 23

新瘙痒部位: 22

新瘙痒部位: 18

新瘙痒部位: 16

新瘙痒部位: 21

新瘙痒部位: 14

新瘙痒部位: 10

新瘙痒部位: 23

新瘙痒部位: 23

新瘙痒部位: 8

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| time/ | |

| fps | 53 |

| iterations | 6 |

| time\_elapsed | 114 |

| total\_timesteps | 6144 |

| train/ | |

| approx\_kl | 0.0981109 |

| clip\_fraction | 0.57 |

| clip\_range | 0.2 |

| entropy\_loss | -43.5 |

| explained\_variance | -0.09506357 |

| learning\_rate | 0.0003 |

| loss | -0.552 |

| n\_updates | 50 |

| policy\_gradient\_loss | -0.0884 |

| std | 1.04 |

| value\_loss | 0.0561 |

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新瘙痒部位: 3

新瘙痒部位: 13

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| time/ | |

| fps | 52 |

| iterations | 7 |

| time\_elapsed | 136 |

| total\_timesteps | 7168 |

| train/ | |

| approx\_kl | 0.10439466 |

| clip\_fraction | 0.597 |

| clip\_range | 0.2 |

| entropy\_loss | -43.8 |

| explained\_variance | 0.086755335 |

| learning\_rate | 0.0003 |

| loss | -0.576 |

| n\_updates | 60 |

| policy\_gradient\_loss | -0.0925 |

| std | 1.05 |

| value\_loss | 0.0499 |

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新瘙痒部位: 9

新瘙痒部位: 13

新瘙痒部位: 4

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| time/ | |

| fps | 53 |

| iterations | 8 |

| time\_elapsed | 152 |

| total\_timesteps | 8192 |

| train/ | |

| approx\_kl | 0.12755686 |

| clip\_fraction | 0.612 |

| clip\_range | 0.2 |

| entropy\_loss | -44.1 |

| explained\_variance | -4.011945 |

| learning\_rate | 0.0003 |

| loss | -0.557 |

| n\_updates | 70 |

| policy\_gradient\_loss | -0.109 |

| std | 1.06 |

| value\_loss | 0.0118 |

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新瘙痒部位: 13

新瘙痒部位: 12

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| time/ | |

| fps | 52 |

| iterations | 9 |

| time\_elapsed | 176 |

| total\_timesteps | 9216 |

| train/ | |

| approx\_kl | 0.1232946 |

| clip\_fraction | 0.627 |

| clip\_range | 0.2 |

| entropy\_loss | -44.2 |

| explained\_variance | -1.2884443 |

| learning\_rate | 0.0003 |

| loss | -0.578 |

| n\_updates | 80 |

| policy\_gradient\_loss | -0.11 |

| std | 1.06 |

| value\_loss | 0.00983 |

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新瘙痒部位: 8

新瘙痒部位: 9

新瘙痒部位: 9

新瘙痒部位: 16

新瘙痒部位: 20

新瘙痒部位: 17

新瘙痒部位: 16

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| time/ | |

| fps | 49 |

| iterations | 10 |

| time\_elapsed | 207 |

| total\_timesteps | 10240 |

| train/ | |

| approx\_kl | 0.12378893 |

| clip\_fraction | 0.642 |

| clip\_range | 0.2 |

| entropy\_loss | -44.4 |

| explained\_variance | -3.1356049 |

| learning\_rate | 0.0003 |

| loss | -0.586 |

| n\_updates | 90 |

| policy\_gradient\_loss | -0.119 |

| std | 1.07 |

| value\_loss | 0.00513 |

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新瘙痒部位: 21

新瘙痒部位: 2

新瘙痒部位: 4

新瘙痒部位: 17

新瘙痒部位: 2

新瘙痒部位: 10

新瘙痒部位: 19

新瘙痒部位: 20

新瘙痒部位: 5

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| time/ | |

| fps | 47 |

| iterations | 11 |

| time\_elapsed | 235 |

| total\_timesteps | 11264 |

| train/ | |

| approx\_kl | 0.115480155 |

| clip\_fraction | 0.592 |

| clip\_range | 0.2 |

| entropy\_loss | -44.7 |

| explained\_variance | -0.17692375 |

| learning\_rate | 0.0003 |

| loss | -0.568 |

| n\_updates | 100 |

| policy\_gradient\_loss | -0.0906 |

| std | 1.08 |

| value\_loss | 0.0241 |

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新瘙痒部位: 8

新瘙痒部位: 16

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| time/ | |

| fps | 47 |

| iterations | 12 |

| time\_elapsed | 259 |

| total\_timesteps | 12288 |

| train/ | |

| approx\_kl | 0.12790832 |

| clip\_fraction | 0.617 |

| clip\_range | 0.2 |

| entropy\_loss | -45 |

| explained\_variance | -0.14206326 |

| learning\_rate | 0.0003 |

| loss | -0.558 |

| n\_updates | 110 |

| policy\_gradient\_loss | -0.0909 |

| std | 1.09 |

| value\_loss | 0.0341 |

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新瘙痒部位: 20

新瘙痒部位: 10

新瘙痒部位: 14

新瘙痒部位: 22

新瘙痒部位: 5

新瘙痒部位: 10

新瘙痒部位: 3

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| time/ | |

| fps | 48 |

| iterations | 13 |

| time\_elapsed | 274 |

| total\_timesteps | 13312 |

| train/ | |

| approx\_kl | 0.14127102 |

| clip\_fraction | 0.653 |

| clip\_range | 0.2 |

| entropy\_loss | -45.3 |

| explained\_variance | -4.3499484 |

| learning\_rate | 0.0003 |

| loss | -0.593 |

| n\_updates | 120 |

| policy\_gradient\_loss | -0.115 |

| std | 1.1 |

| value\_loss | 0.0081 |

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新瘙痒部位: 4

新瘙痒部位: 13

新瘙痒部位: 14

新瘙痒部位: 19

新瘙痒部位: 3

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| time/ | |

| fps | 49 |

| iterations | 14 |

| time\_elapsed | 290 |

| total\_timesteps | 14336 |

| train/ | |

| approx\_kl | 0.1310885 |

| clip\_fraction | 0.614 |

| clip\_range | 0.2 |

| entropy\_loss | -45.6 |

| explained\_variance | 0.058725417 |

| learning\_rate | 0.0003 |

| loss | -0.598 |

| n\_updates | 130 |

| policy\_gradient\_loss | -0.0906 |

| std | 1.11 |

| value\_loss | 0.0169 |

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新瘙痒部位: 16

新瘙痒部位: 5

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| time/ | |

| fps | 49 |

| iterations | 15 |

| time\_elapsed | 307 |

| total\_timesteps | 15360 |

| train/ | |

| approx\_kl | 0.12574673 |

| clip\_fraction | 0.624 |

| clip\_range | 0.2 |

| entropy\_loss | -45.9 |

| explained\_variance | -0.15805984 |

| learning\_rate | 0.0003 |

| loss | -0.572 |

| n\_updates | 140 |

| policy\_gradient\_loss | -0.0921 |

| std | 1.12 |

| value\_loss | 0.00874 |

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新瘙痒部位: 14

新瘙痒部位: 19

新瘙痒部位: 15

新瘙痒部位: 14

新瘙痒部位: 5

新瘙痒部位: 10

新瘙痒部位: 13

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| time/ | |

| fps | 50 |

| iterations | 16 |

| time\_elapsed | 323 |

| total\_timesteps | 16384 |

| train/ | |

| approx\_kl | 0.11820122 |

| clip\_fraction | 0.612 |

| clip\_range | 0.2 |

| entropy\_loss | -46.1 |

| explained\_variance | -4.5764017 |

| learning\_rate | 0.0003 |

| loss | -0.559 |

| n\_updates | 150 |

| policy\_gradient\_loss | -0.102 |

| std | 1.13 |

| value\_loss | 0.00475 |

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新瘙痒部位: 2

新瘙痒部位: 17

新瘙痒部位: 16

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| time/ | |

| fps | 51 |

| iterations | 17 |

| time\_elapsed | 339 |

| total\_timesteps | 17408 |

| train/ | |

| approx\_kl | 0.11935864 |

| clip\_fraction | 0.587 |

| clip\_range | 0.2 |

| entropy\_loss | -46.4 |

| explained\_variance | -0.006325841 |

| learning\_rate | 0.0003 |

| loss | -0.553 |

| n\_updates | 160 |

| policy\_gradient\_loss | -0.0762 |

| std | 1.15 |

| value\_loss | 0.0146 |

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新瘙痒部位: 15

新瘙痒部位: 10

新瘙痒部位: 22

新瘙痒部位: 9

新瘙痒部位: 23

新瘙痒部位: 13

新瘙痒部位: 14

新瘙痒部位: 18

新瘙痒部位: 17

新瘙痒部位: 13

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| time/ | |

| fps | 51 |

| iterations | 18 |

| time\_elapsed | 356 |

| total\_timesteps | 18432 |

| train/ | |

| approx\_kl | 0.13263571 |

| clip\_fraction | 0.622 |

| clip\_range | 0.2 |

| entropy\_loss | -46.8 |

| explained\_variance | -0.66125214 |

| learning\_rate | 0.0003 |

| loss | -0.595 |

| n\_updates | 170 |

| policy\_gradient\_loss | -0.0952 |

| std | 1.16 |

| value\_loss | 0.00397 |

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新瘙痒部位: 10

新瘙痒部位: 13

新瘙痒部位: 12

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| time/ | |

| fps | 51 |

| iterations | 19 |

| time\_elapsed | 376 |

| total\_timesteps | 19456 |

| train/ | |

| approx\_kl | 0.10894367 |

| clip\_fraction | 0.578 |

| clip\_range | 0.2 |

| entropy\_loss | -47.1 |

| explained\_variance | 0.021888196 |

| learning\_rate | 0.0003 |

| loss | -0.544 |

| n\_updates | 180 |

| policy\_gradient\_loss | -0.0706 |

| std | 1.17 |

| value\_loss | 0.0184 |

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新瘙痒部位: 12

新瘙痒部位: 10

新瘙痒部位: 2

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| time/ | |

| fps | 51 |

| iterations | 20 |

| time\_elapsed | 396 |

| total\_timesteps | 20480 |

| train/ | |

| approx\_kl | 0.12324915 |

| clip\_fraction | 0.619 |

| clip\_range | 0.2 |

| entropy\_loss | -47.5 |

| explained\_variance | -3.088739 |

| learning\_rate | 0.0003 |

| loss | -0.6 |

| n\_updates | 190 |

| policy\_gradient\_loss | -0.0965 |

| std | 1.18 |

| value\_loss | 0.00495 |

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新瘙痒部位: 21

新瘙痒部位: 3

新瘙痒部位: 15

新瘙痒部位: 3

新瘙痒部位: 5

新瘙痒部位: 5

新瘙痒部位: 23

新瘙痒部位: 16

新瘙痒部位: 22

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| time/ | |

| fps | 51 |

| iterations | 21 |

| time\_elapsed | 415 |

| total\_timesteps | 21504 |

| train/ | |

| approx\_kl | 0.1326653 |

| clip\_fraction | 0.612 |

| clip\_range | 0.2 |

| entropy\_loss | -47.7 |

| explained\_variance | -3.259478 |

| learning\_rate | 0.0003 |

| loss | -0.578 |

| n\_updates | 200 |

| policy\_gradient\_loss | -0.0977 |

| std | 1.19 |

| value\_loss | 0.00295 |

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新瘙痒部位: 14

新瘙痒部位: 2

新瘙痒部位: 11

新瘙痒部位: 10

新瘙痒部位: 22

新瘙痒部位: 20

新瘙痒部位: 20

新瘙痒部位: 4

新瘙痒部位: 16

新瘙痒部位: 17

新瘙痒部位: 16

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| time/ | |

| fps | 51 |

| iterations | 22 |

| time\_elapsed | 437 |

| total\_timesteps | 22528 |

| train/ | |

| approx\_kl | 0.130395 |

| clip\_fraction | 0.639 |

| clip\_range | 0.2 |

| entropy\_loss | -48 |

| explained\_variance | -0.059292197 |

| learning\_rate | 0.0003 |

| loss | -0.562 |

| n\_updates | 210 |

| policy\_gradient\_loss | -0.0812 |

| std | 1.21 |

| value\_loss | 0.0318 |

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新瘙痒部位: 5

新瘙痒部位: 12

新瘙痒部位: 4

新瘙痒部位: 5

新瘙痒部位: 16

新瘙痒部位: 22

新瘙痒部位: 9

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| time/ | |

| fps | 51 |

| iterations | 23 |

| time\_elapsed | 457 |

| total\_timesteps | 23552 |

| train/ | |

| approx\_kl | 0.12425099 |

| clip\_fraction | 0.583 |

| clip\_range | 0.2 |

| entropy\_loss | -48.4 |

| explained\_variance | 0.022079706 |

| learning\_rate | 0.0003 |

| loss | -0.577 |

| n\_updates | 220 |

| policy\_gradient\_loss | -0.0733 |

| std | 1.23 |

| value\_loss | 0.0709 |

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新瘙痒部位: 18

新瘙痒部位: 22

新瘙痒部位: 14

新瘙痒部位: 5

新瘙痒部位: 9

新瘙痒部位: 2

新瘙痒部位: 2

新瘙痒部位: 20

新瘙痒部位: 13

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| time/ | |

| fps | 51 |

| iterations | 24 |

| time\_elapsed | 477 |

| total\_timesteps | 24576 |

| train/ | |

| approx\_kl | 0.118701264 |

| clip\_fraction | 0.581 |

| clip\_range | 0.2 |

| entropy\_loss | -48.8 |

| explained\_variance | -0.04960084 |

| learning\_rate | 0.0003 |

| loss | -0.592 |

| n\_updates | 230 |

| policy\_gradient\_loss | -0.0912 |

| std | 1.24 |

| value\_loss | 0.0388 |

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新瘙痒部位: 21

新瘙痒部位: 20

新瘙痒部位: 4

新瘙痒部位: 22

新瘙痒部位: 19

新瘙痒部位: 15

新瘙痒部位: 20

新瘙痒部位: 5

新瘙痒部位: 18

新瘙痒部位: 8

新瘙痒部位: 21

新瘙痒部位: 4

新瘙痒部位: 20

新瘙痒部位: 11

新瘙痒部位: 4

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| time/ | |

| fps | 51 |

| iterations | 25 |

| time\_elapsed | 498 |

| total\_timesteps | 25600 |

| train/ | |

| approx\_kl | 0.14140448 |

| clip\_fraction | 0.603 |

| clip\_range | 0.2 |

| entropy\_loss | -49.1 |

| explained\_variance | -0.19013166 |

| learning\_rate | 0.0003 |

| loss | -0.599 |

| n\_updates | 240 |

| policy\_gradient\_loss | -0.0883 |

| std | 1.25 |

| value\_loss | 0.0836 |

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新瘙痒部位: 10

新瘙痒部位: 14

新瘙痒部位: 13

新瘙痒部位: 20

新瘙痒部位: 16

新瘙痒部位: 11

新瘙痒部位: 11

新瘙痒部位: 12

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| time/ | |

| fps | 51 |

| iterations | 26 |

| time\_elapsed | 515 |

| total\_timesteps | 26624 |

| train/ | |

| approx\_kl | 0.12407422 |

| clip\_fraction | 0.634 |

| clip\_range | 0.2 |

| entropy\_loss | -49.4 |

| explained\_variance | -0.3071022 |

| learning\_rate | 0.0003 |

| loss | -0.587 |

| n\_updates | 250 |

| policy\_gradient\_loss | -0.103 |

| std | 1.26 |

| value\_loss | 0.105 |

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新瘙痒部位: 4

新瘙痒部位: 9

新瘙痒部位: 22

新瘙痒部位: 11

新瘙痒部位: 14

新瘙痒部位: 17

新瘙痒部位: 3

新瘙痒部位: 17

新瘙痒部位: 10

新瘙痒部位: 23

新瘙痒部位: 22

新瘙痒部位: 3

新瘙痒部位: 11

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| time/ | |

| fps | 52 |

| iterations | 27 |

| time\_elapsed | 531 |

| total\_timesteps | 27648 |

| train/ | |

| approx\_kl | 0.15654933 |

| clip\_fraction | 0.644 |

| clip\_range | 0.2 |

| entropy\_loss | -49.6 |

| explained\_variance | -0.9156482 |

| learning\_rate | 0.0003 |

| loss | -0.63 |

| n\_updates | 260 |

| policy\_gradient\_loss | -0.108 |

| std | 1.27 |

| value\_loss | 0.0359 |

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新瘙痒部位: 16

新瘙痒部位: 16

新瘙痒部位: 14

新瘙痒部位: 4

新瘙痒部位: 4

新瘙痒部位: 5

新瘙痒部位: 4

新瘙痒部位: 16

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| time/ | |

| fps | 51 |

| iterations | 28 |

| time\_elapsed | 554 |

| total\_timesteps | 28672 |

| train/ | |

| approx\_kl | 0.1419775 |

| clip\_fraction | 0.646 |

| clip\_range | 0.2 |

| entropy\_loss | -49.9 |

| explained\_variance | -0.03134525 |

| learning\_rate | 0.0003 |

| loss | -0.627 |

| n\_updates | 270 |

| policy\_gradient\_loss | -0.0976 |

| std | 1.28 |

| value\_loss | 0.0846 |

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新瘙痒部位: 16

新瘙痒部位: 19

新瘙痒部位: 4

新瘙痒部位: 3

新瘙痒部位: 14

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| time/ | |

| fps | 51 |

| iterations | 29 |

| time\_elapsed | 574 |

| total\_timesteps | 29696 |

| train/ | |

| approx\_kl | 0.13622534 |

| clip\_fraction | 0.625 |

| clip\_range | 0.2 |

| entropy\_loss | -50.2 |

| explained\_variance | -0.5446954 |

| learning\_rate | 0.0003 |

| loss | -0.613 |

| n\_updates | 280 |

| policy\_gradient\_loss | -0.106 |

| std | 1.3 |

| value\_loss | 0.0613 |

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新瘙痒部位: 23

新瘙痒部位: 9

新瘙痒部位: 18

新瘙痒部位: 2

新瘙痒部位: 13

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| time/ | |

| fps | 51 |

| iterations | 30 |

| time\_elapsed | 598 |

| total\_timesteps | 30720 |

| train/ | |

| approx\_kl | 0.13718767 |

| clip\_fraction | 0.651 |

| clip\_range | 0.2 |

| entropy\_loss | -50.4 |

| explained\_variance | -1.5895431 |

| learning\_rate | 0.0003 |

| loss | -0.649 |

| n\_updates | 290 |

| policy\_gradient\_loss | -0.118 |

| std | 1.31 |

| value\_loss | 0.0221 |

----------------------------------------

新瘙痒部位: 22

新瘙痒部位: 14

新瘙痒部位: 2

新瘙痒部位: 10

新瘙痒部位: 19

新瘙痒部位: 19

新瘙痒部位: 14

----------------------------------------

| time/ | |

| fps | 50 |

| iterations | 31 |

| time\_elapsed | 629 |

| total\_timesteps | 31744 |

| train/ | |

| approx\_kl | 0.15204018 |

| clip\_fraction | 0.65 |

| clip\_range | 0.2 |

| entropy\_loss | -50.7 |

| explained\_variance | -0.5611286 |

| learning\_rate | 0.0003 |

| loss | -0.644 |

| n\_updates | 300 |

| policy\_gradient\_loss | -0.104 |

| std | 1.32 |

| value\_loss | 0.0222 |

----------------------------------------

新瘙痒部位: 16

新瘙痒部位: 12

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| time/ | |

| fps | 50 |

| iterations | 32 |

| time\_elapsed | 650 |

| total\_timesteps | 32768 |

| train/ | |

| approx\_kl | 0.13694525 |

| clip\_fraction | 0.632 |

| clip\_range | 0.2 |

| entropy\_loss | -51.1 |

| explained\_variance | -0.21971369 |

| learning\_rate | 0.0003 |

| loss | -0.607 |

| n\_updates | 310 |

| policy\_gradient\_loss | -0.0973 |

| std | 1.34 |

| value\_loss | 0.0194 |

-----------------------------------------

新瘙痒部位: 8

新瘙痒部位: 3

新瘙痒部位: 15

新瘙痒部位: 3

新瘙痒部位: 3

新瘙痒部位: 12

新瘙痒部位: 14

新瘙痒部位: 15

新瘙痒部位: 3

新瘙痒部位: 20

新瘙痒部位: 14

新瘙痒部位: 15

新瘙痒部位: 11

新瘙痒部位: 8

----------------------------------------

| time/ | |

| fps | 49 |

| iterations | 33 |

| time\_elapsed | 680 |

| total\_timesteps | 33792 |

| train/ | |

| approx\_kl | 0.14612855 |

| clip\_fraction | 0.629 |

| clip\_range | 0.2 |

| entropy\_loss | -51.3 |

| explained\_variance | -7.1424856 |

| learning\_rate | 0.0003 |

| loss | -0.654 |

| n\_updates | 320 |

| policy\_gradient\_loss | -0.111 |

| std | 1.35 |

| value\_loss | 0.00761 |

----------------------------------------

新瘙痒部位: 14

新瘙痒部位: 14

新瘙痒部位: 3

新瘙痒部位: 13

-----------------------------------------

| time/ | |

| fps | 49 |

| iterations | 34 |

| time\_elapsed | 702 |

| total\_timesteps | 34816 |

| train/ | |

| approx\_kl | 0.13753852 |

| clip\_fraction | 0.618 |

| clip\_range | 0.2 |

| entropy\_loss | -51.6 |

| explained\_variance | -0.07198346 |

| learning\_rate | 0.0003 |

| loss | -0.588 |

| n\_updates | 330 |

| policy\_gradient\_loss | -0.0874 |

| std | 1.36 |

| value\_loss | 0.125 |

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新瘙痒部位: 9

新瘙痒部位: 23

新瘙痒部位: 16

新瘙痒部位: 8

新瘙痒部位: 23

新瘙痒部位: 13

----------------------------------------

| time/ | |

| fps | 49 |

| iterations | 35 |

| time\_elapsed | 728 |

| total\_timesteps | 35840 |

| train/ | |

| approx\_kl | 0.13617128 |

| clip\_fraction | 0.632 |

| clip\_range | 0.2 |

| entropy\_loss | -51.9 |

| explained\_variance | -1.3760664 |

| learning\_rate | 0.0003 |

| loss | -0.621 |

| n\_updates | 340 |

| policy\_gradient\_loss | -0.11 |

| std | 1.37 |

| value\_loss | 0.0318 |

----------------------------------------

新瘙痒部位: 4

新瘙痒部位: 14

新瘙痒部位: 18

新瘙痒部位: 20

新瘙痒部位: 23

新瘙痒部位: 20

新瘙痒部位: 8

新瘙痒部位: 21

新瘙痒部位: 5

新瘙痒部位: 9

新瘙痒部位: 21

新瘙痒部位: 17

新瘙痒部位: 22

新瘙痒部位: 10

新瘙痒部位: 10

新瘙痒部位: 20

新瘙痒部位: 10

新瘙痒部位: 11

新瘙痒部位: 9

新瘙痒部位: 4

-----------------------------------------

| time/ | |

| fps | 48 |

| iterations | 36 |

| time\_elapsed | 752 |

| total\_timesteps | 36864 |

| train/ | |

| approx\_kl | 0.1503432 |

| clip\_fraction | 0.654 |

| clip\_range | 0.2 |

| entropy\_loss | -52.2 |

| explained\_variance | -0.39044917 |

| learning\_rate | 0.0003 |

| loss | -0.645 |

| n\_updates | 350 |

| policy\_gradient\_loss | -0.102 |

| std | 1.39 |

| value\_loss | 0.0386 |

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新瘙痒部位: 4

新瘙痒部位: 14

新瘙痒部位: 8

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| time/ | |

| fps | 48 |

| iterations | 37 |

| time\_elapsed | 788 |

| total\_timesteps | 37888 |

| train/ | |

| approx\_kl | 0.102230094 |

| clip\_fraction | 0.617 |

| clip\_range | 0.2 |

| entropy\_loss | -52.5 |

| explained\_variance | -0.040863752 |

| learning\_rate | 0.0003 |

| loss | -0.622 |

| n\_updates | 360 |

| policy\_gradient\_loss | -0.0879 |

| std | 1.4 |

| value\_loss | 0.29 |

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新瘙痒部位: 2

新瘙痒部位: 19

新瘙痒部位: 16

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| time/ | |

| fps | 47 |

| iterations | 38 |

| time\_elapsed | 810 |

| total\_timesteps | 38912 |

| train/ | |

| approx\_kl | 0.1484667 |

| clip\_fraction | 0.641 |

| clip\_range | 0.2 |

| entropy\_loss | -52.8 |

| explained\_variance | -2.4991415 |

| learning\_rate | 0.0003 |

| loss | -0.667 |

| n\_updates | 370 |

| policy\_gradient\_loss | -0.113 |

| std | 1.42 |

| value\_loss | 0.038 |

----------------------------------------

新瘙痒部位: 8

新瘙痒部位: 2

新瘙痒部位: 17

新瘙痒部位: 15

新瘙痒部位: 21

新瘙痒部位: 20

新瘙痒部位: 16

----------------------------------------

| time/ | |

| fps | 47 |

| iterations | 39 |

| time\_elapsed | 834 |

| total\_timesteps | 39936 |

| train/ | |

| approx\_kl | 0.15249667 |

| clip\_fraction | 0.657 |

| clip\_range | 0.2 |

| entropy\_loss | -53.1 |

| explained\_variance | -2.857306 |

| learning\_rate | 0.0003 |

| loss | -0.68 |

| n\_updates | 380 |

| policy\_gradient\_loss | -0.117 |

| std | 1.43 |

| value\_loss | 0.0152 |

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新瘙痒部位: 12

新瘙痒部位: 4

新瘙痒部位: 10

新瘙痒部位: 14

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| time/ | |

| fps | 48 |

| iterations | 40 |

| time\_elapsed | 851 |

| total\_timesteps | 40960 |

| train/ | |

| approx\_kl | 0.1477615 |

| clip\_fraction | 0.625 |

| clip\_range | 0.2 |

| entropy\_loss | -53.4 |

| explained\_variance | -0.31647098 |

| learning\_rate | 0.0003 |

| loss | -0.646 |

| n\_updates | 390 |

| policy\_gradient\_loss | -0.0964 |

| std | 1.44 |

| value\_loss | 0.0295 |

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新瘙痒部位: 2

新瘙痒部位: 13

----------------------------------------

| time/ | |

| fps | 48 |

| iterations | 41 |

| time\_elapsed | 869 |

| total\_timesteps | 41984 |

| train/ | |

| approx\_kl | 0.1489178 |

| clip\_fraction | 0.632 |

| clip\_range | 0.2 |

| entropy\_loss | -53.7 |

| explained\_variance | -1.4065754 |

| learning\_rate | 0.0003 |

| loss | -0.666 |

| n\_updates | 400 |

| policy\_gradient\_loss | -0.0991 |

| std | 1.46 |

| value\_loss | 0.0223 |

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新瘙痒部位: 10

新瘙痒部位: 22

新瘙痒部位: 23

新瘙痒部位: 18

新瘙痒部位: 21

新瘙痒部位: 22

新瘙痒部位: 9

新瘙痒部位: 12

新瘙痒部位: 16

新瘙痒部位: 4

新瘙痒部位: 4

新瘙痒部位: 11

新瘙痒部位: 4

新瘙痒部位: 18

新瘙痒部位: 16

----------------------------------------

| time/ | |

| fps | 48 |

| iterations | 42 |

| time\_elapsed | 888 |

| total\_timesteps | 43008 |

| train/ | |

| approx\_kl | 0.15725785 |

| clip\_fraction | 0.662 |

| clip\_range | 0.2 |

| entropy\_loss | -54 |

| explained\_variance | -7.486615 |

| learning\_rate | 0.0003 |

| loss | -0.649 |

| n\_updates | 410 |

| policy\_gradient\_loss | -0.111 |

| std | 1.47 |

| value\_loss | 0.00709 |

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新瘙痒部位: 2

新瘙痒部位: 18

新瘙痒部位: 5

----------------------------------------

| time/ | |

| fps | 48 |

| iterations | 43 |

| time\_elapsed | 911 |

| total\_timesteps | 44032 |

| train/ | |

| approx\_kl | 0.12354443 |

| clip\_fraction | 0.628 |

| clip\_range | 0.2 |

| entropy\_loss | -54.4 |

| explained\_variance | 0.06008643 |

| learning\_rate | 0.0003 |

| loss | -0.644 |

| n\_updates | 420 |

| policy\_gradient\_loss | -0.0823 |

| std | 1.49 |

| value\_loss | 0.067 |

----------------------------------------

新瘙痒部位: 10

新瘙痒部位: 5

新瘙痒部位: 16

新瘙痒部位: 21

新瘙痒部位: 13

新瘙痒部位: 14

新瘙痒部位: 8

新瘙痒部位: 10

新瘙痒部位: 17

新瘙痒部位: 8

新瘙痒部位: 14

新瘙痒部位: 5

新瘙痒部位: 8

----------------------------------------

| time/ | |

| fps | 48 |

| iterations | 44 |

| time\_elapsed | 935 |

| total\_timesteps | 45056 |

| train/ | |

| approx\_kl | 0.130422 |

| clip\_fraction | 0.622 |

| clip\_range | 0.2 |

| entropy\_loss | -54.8 |

| explained\_variance | -1.6722054 |

| learning\_rate | 0.0003 |

| loss | -0.657 |

| n\_updates | 430 |

| policy\_gradient\_loss | -0.0962 |

| std | 1.51 |

| value\_loss | 0.0131 |

----------------------------------------

新瘙痒部位: 15

新瘙痒部位: 19

新瘙痒部位: 17

新瘙痒部位: 15

新瘙痒部位: 11

新瘙痒部位: 5

新瘙痒部位: 23

新瘙痒部位: 2

新瘙痒部位: 2

-----------------------------------------

| time/ | |

| fps | 48 |

| iterations | 45 |

| time\_elapsed | 952 |

| total\_timesteps | 46080 |

| train/ | |

| approx\_kl | 0.1519242 |

| clip\_fraction | 0.654 |

| clip\_range | 0.2 |

| entropy\_loss | -55.1 |

| explained\_variance | -0.08827329 |

| learning\_rate | 0.0003 |

| loss | -0.666 |

| n\_updates | 440 |

| policy\_gradient\_loss | -0.0949 |

| std | 1.53 |

| value\_loss | 0.126 |

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新瘙痒部位: 4

新瘙痒部位: 2

----------------------------------------

| time/ | |

| fps | 48 |

| iterations | 46 |

| time\_elapsed | 974 |

| total\_timesteps | 47104 |

| train/ | |

| approx\_kl | 0.13125512 |

| clip\_fraction | 0.606 |

| clip\_range | 0.2 |

| entropy\_loss | -55.5 |

| explained\_variance | -0.1494323 |

| learning\_rate | 0.0003 |

| loss | -0.625 |

| n\_updates | 450 |

| policy\_gradient\_loss | -0.087 |

| std | 1.55 |

| value\_loss | 0.134 |

----------------------------------------

新瘙痒部位: 4

新瘙痒部位: 22

新瘙痒部位: 21

新瘙痒部位: 10

新瘙痒部位: 22

新瘙痒部位: 13

新瘙痒部位: 18

新瘙痒部位: 10

新瘙痒部位: 5

---------------------------------------

| time/ | |

| fps | 48 |

| iterations | 47 |

| time\_elapsed | 996 |

| total\_timesteps | 48128 |

| train/ | |

| approx\_kl | 0.1566094 |

| clip\_fraction | 0.666 |

| clip\_range | 0.2 |

| entropy\_loss | -55.8 |

| explained\_variance | -6.64518 |

| learning\_rate | 0.0003 |

| loss | -0.691 |

| n\_updates | 460 |

| policy\_gradient\_loss | -0.115 |

| std | 1.56 |

| value\_loss | 0.0257 |

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新瘙痒部位: 11

新瘙痒部位: 2

新瘙痒部位: 11

新瘙痒部位: 14

新瘙痒部位: 16

-----------------------------------------

| time/ | |

| fps | 48 |

| iterations | 48 |

| time\_elapsed | 1014 |

| total\_timesteps | 49152 |

| train/ | |

| approx\_kl | 0.12366998 |

| clip\_fraction | 0.594 |

| clip\_range | 0.2 |

| entropy\_loss | -56.1 |

| explained\_variance | -0.16299129 |

| learning\_rate | 0.0003 |

| loss | -0.657 |

| n\_updates | 470 |

| policy\_gradient\_loss | -0.0775 |

| std | 1.59 |

| value\_loss | 0.0754 |

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新瘙痒部位: 23

新瘙痒部位: 13

新瘙痒部位: 10

新瘙痒部位: 18

新瘙痒部位: 2

-----------------------------------------

| time/ | |

| fps | 48 |

| iterations | 49 |

| time\_elapsed | 1035 |

| total\_timesteps | 50176 |

| train/ | |

| approx\_kl | 0.13879733 |

| clip\_fraction | 0.647 |

| clip\_range | 0.2 |

| entropy\_loss | -56.5 |

| explained\_variance | -0.47840416 |

| learning\_rate | 0.0003 |

| loss | -0.671 |

| n\_updates | 480 |

| policy\_gradient\_loss | -0.0991 |

| std | 1.6 |

| value\_loss | 0.022 |

-----------------------------------------

模型已保存至: itch\_touch\_model.zip

C:\Users\Administrator\BabyBench2025\_Starter\_Kit\itch\_training.py:139: UserWarning: Glyph 35302 (\N{CJK UNIFIED IDEOGRAPH-89E6}) missing from font(s) DejaVu Sans.

plt.tight\_layout()

C:\Users\Administrator\BabyBench2025\_Starter\_Kit\itch\_training.py:139: UserWarning: Glyph 25720 (\N{CJK UNIFIED IDEOGRAPH-6478}) missing from font(s) DejaVu Sans.

plt.tight\_layout()

C:\Users\Administrator\BabyBench2025\_Starter\_Kit\itch\_training.py:139: UserWarning: Glyph 27425 (\N{CJK UNIFIED IDEOGRAPH-6B21}) missing from font(s) DejaVu Sans.

plt.tight\_layout()

C:\Users\Administrator\BabyBench2025\_Starter\_Kit\itch\_training.py:139: UserWarning: Glyph 25968 (\N{CJK UNIFIED IDEOGRAPH-6570}) missing from font(s) DejaVu Sans.

plt.tight\_layout()

C:\Users\Administrator\BabyBench2025\_Starter\_Kit\itch\_training.py:139: UserWarning: Glyph 36523 (\N{CJK UNIFIED IDEOGRAPH-8EAB}) missing from font(s) DejaVu Sans.

plt.tight\_layout()

C:\Users\Administrator\BabyBench2025\_Starter\_Kit\itch\_training.py:139: UserWarning: Glyph 20307 (\N{CJK UNIFIED IDEOGRAPH-4F53}) missing from font(s) DejaVu Sans.

plt.tight\_layout()

C:\Users\Administrator\BabyBench2025\_Starter\_Kit\itch\_training.py:139: UserWarning: Glyph 37096 (\N{CJK UNIFIED IDEOGRAPH-90E8}) missing from font(s) DejaVu Sans.

plt.tight\_layout()

C:\Users\Administrator\BabyBench2025\_Starter\_Kit\itch\_training.py:139: UserWarning: Glyph 20301 (\N{CJK UNIFIED IDEOGRAPH-4F4D}) missing from font(s) DejaVu Sans.

plt.tight\_layout()

C:\Users\Administrator\BabyBench2025\_Starter\_Kit\itch\_training.py:139: UserWarning: Glyph 22270 (\N{CJK UNIFIED IDEOGRAPH-56FE}) missing from font(s) DejaVu Sans.

plt.tight\_layout()

C:\Users\Administrator\BabyBench2025\_Starter\_Kit\itch\_training.py:139: UserWarning: Glyph 24335 (\N{CJK UNIFIED IDEOGRAPH-5F0F}) missing from font(s) DejaVu Sans.

plt.tight\_layout()

C:\Users\Administrator\BabyBench2025\_Starter\_Kit\itch\_training.py:139: UserWarning: Glyph 21508 (\N{CJK UNIFIED IDEOGRAPH-5404}) missing from font(s) DejaVu Sans.

plt.tight\_layout()

C:\Users\Administrator\BabyBench2025\_Starter\_Kit\itch\_training.py:139: UserWarning: Glyph 39057 (\N{CJK UNIFIED IDEOGRAPH-9891}) missing from font(s) DejaVu Sans.

plt.tight\_layout()

C:\Users\Administrator\BabyBench2025\_Starter\_Kit\itch\_training.py:139: UserWarning: Glyph 29575 (\N{CJK UNIFIED IDEOGRAPH-7387}) missing from font(s) DejaVu Sans.

plt.tight\_layout()

C:\Users\Administrator\BabyBench2025\_Starter\_Kit\itch\_training.py:140: UserWarning: Glyph 35302 (\N{CJK UNIFIED IDEOGRAPH-89E6}) missing from font(s) DejaVu Sans.

plt.savefig(save\_path)

C:\Users\Administrator\BabyBench2025\_Starter\_Kit\itch\_training.py:140: UserWarning: Glyph 25720 (\N{CJK UNIFIED IDEOGRAPH-6478}) missing from font(s) DejaVu Sans.

plt.savefig(save\_path)

C:\Users\Administrator\BabyBench2025\_Starter\_Kit\itch\_training.py:140: UserWarning: Glyph 27425 (\N{CJK UNIFIED IDEOGRAPH-6B21}) missing from font(s) DejaVu Sans.

plt.savefig(save\_path)

C:\Users\Administrator\BabyBench2025\_Starter\_Kit\itch\_training.py:140: UserWarning: Glyph 25968 (\N{CJK UNIFIED IDEOGRAPH-6570}) missing from font(s) DejaVu Sans.

plt.savefig(save\_path)

C:\Users\Administrator\BabyBench2025\_Starter\_Kit\itch\_training.py:140: UserWarning: Glyph 36523 (\N{CJK UNIFIED IDEOGRAPH-8EAB}) missing from font(s) DejaVu Sans.

plt.savefig(save\_path)

C:\Users\Administrator\BabyBench2025\_Starter\_Kit\itch\_training.py:140: UserWarning: Glyph 20307 (\N{CJK UNIFIED IDEOGRAPH-4F53}) missing from font(s) DejaVu Sans.

plt.savefig(save\_path)

C:\Users\Administrator\BabyBench2025\_Starter\_Kit\itch\_training.py:140: UserWarning: Glyph 37096 (\N{CJK UNIFIED IDEOGRAPH-90E8}) missing from font(s) DejaVu Sans.

plt.savefig(save\_path)

C:\Users\Administrator\BabyBench2025\_Starter\_Kit\itch\_training.py:140: UserWarning: Glyph 20301 (\N{CJK UNIFIED IDEOGRAPH-4F4D}) missing from font(s) DejaVu Sans.

plt.savefig(save\_path)

C:\Users\Administrator\BabyBench2025\_Starter\_Kit\itch\_training.py:140: UserWarning: Glyph 22270 (\N{CJK UNIFIED IDEOGRAPH-56FE}) missing from font(s) DejaVu Sans.

plt.savefig(save\_path)

C:\Users\Administrator\BabyBench2025\_Starter\_Kit\itch\_training.py:140: UserWarning: Glyph 24335 (\N{CJK UNIFIED IDEOGRAPH-5F0F}) missing from font(s) DejaVu Sans.

plt.savefig(save\_path)

C:\Users\Administrator\BabyBench2025\_Starter\_Kit\itch\_training.py:140: UserWarning: Glyph 21508 (\N{CJK UNIFIED IDEOGRAPH-5404}) missing from font(s) DejaVu Sans.

plt.savefig(save\_path)

C:\Users\Administrator\BabyBench2025\_Starter\_Kit\itch\_training.py:140: UserWarning: Glyph 39057 (\N{CJK UNIFIED IDEOGRAPH-9891}) missing from font(s) DejaVu Sans.

plt.savefig(save\_path)

C:\Users\Administrator\BabyBench2025\_Starter\_Kit\itch\_training.py:140: UserWarning: Glyph 29575 (\N{CJK UNIFIED IDEOGRAPH-7387}) missing from font(s) DejaVu Sans.

plt.savefig(save\_path)

身体图式已保存至: body\_schema.png