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Lane Tracking Algorithm Using Road Models and Particle Filter

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1. Detector

detector 가

가 가

가 가

$$M^i = \{w^i, d^i, \theta^i, \rho^i\} \quad (1)$$

$w^i \sin(\rho^i)$: 모델 윗변의 길이

가 가 가 w d

가 가 [1]. 가 w 0 90 가 0

가 가 가 w * sin p

edge detector (1)

[2][3]. (2)

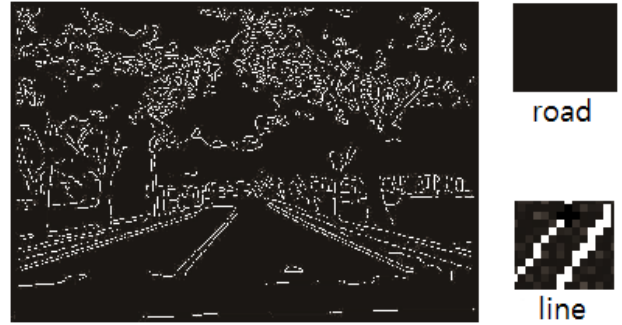
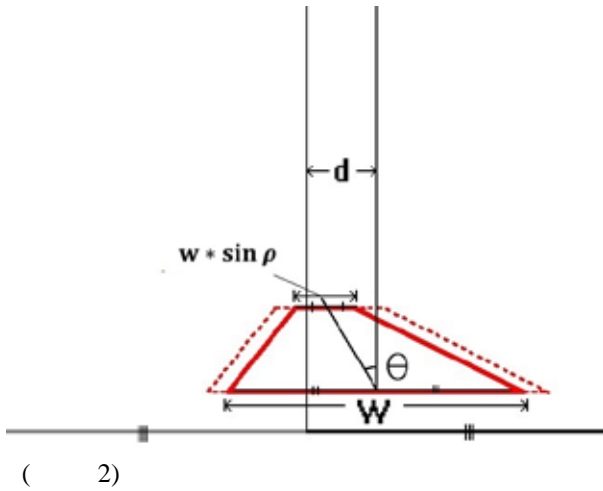
가 가 [4][5][6]. 가 5 (2)

[7][8].



(1)

2.



(3) Edge Detector

$$f_E(I, M^i) = \frac{1}{n} \sum_{i=0}^n L(Z_i) \quad (3)$$

3.

가 가 . detector

. Edge detector
Color detector
가 detector
detector

가

detector 가

$P(M^i)$

$$P(M^i) = \alpha f_E(I, M^i) + \beta f_C(I, M^i) \quad (2)$$

. I
 f_E f_C Edge detector Color detector
. α β
edge color

• **Edge Detector:** detector edge 가
. edge

Canny edge detector
가
(3)

Edge detection

Edge Detector

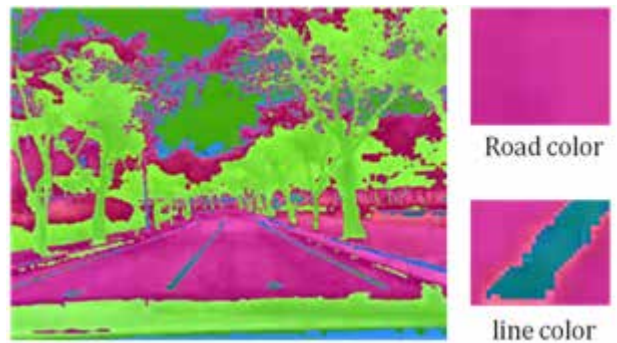
(3) Z_i L
, n

• **Color Detector:**

가 . 가

가

YUV - V (4) YU -



(4) YU

Y, U 2 가
edge 가 . YU RGB
가 .
Y, U 2 가
가

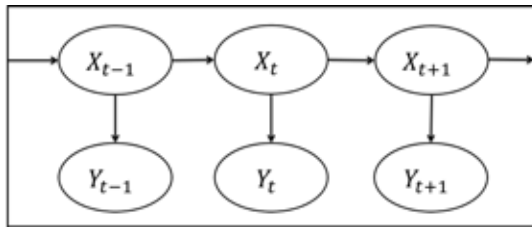
$$f_C(I, M^i) = \log_{10} \left((4|V|\pi^2)^{-\frac{1}{2}} \exp\left(-\frac{1}{2}(x - \mu)V^{-1}(x - \mu)'\right) \right) \quad (4)$$

(4) μ V 가 (Y, U) . Edge color
 Detector β log 가

4.

가

[7][8].



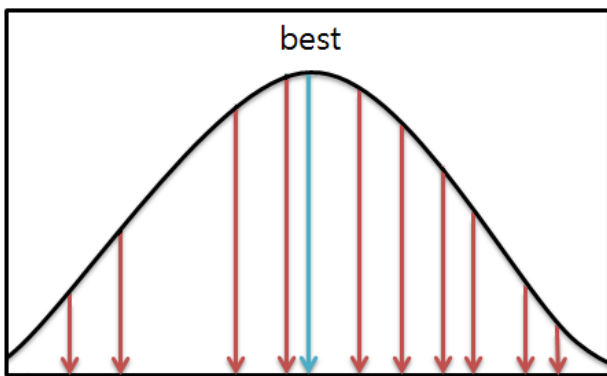
(5)

(5) X
 Y
 Y

가

가

가



(6) 가

1)

2)

3) 2)

10

가

4) 가 가 (6)
 가 가

가

가

5.

, Microsoft lifecam hd-5000

10

640x480 px

270cm 350cm

15cm (1)

290

70

300cm



(7)

(7)

가

(7)

가

가

6.

가

가

가

URP

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