DAFTAR PUSTAKA

Achmad, B., 2003. *Diklat Kuliah Pengolahan Citra.* Jogjakarta: s.n.

Ackland, P., Resnikoff, S. & Bourne, R., 2017. World blindness and visual impairment: despite many successes, the problem is growing. *Community Eye Health,* pp. 71-73.

Anwar, A. & Aljahdali, S., 2017. A Smart Stick for Assisting Blind People. *IOSR Journal of Computer Engineering,* pp. 86-90.

Apexia, 2018. *Projective Geometry.* [Online]
Available at: http://epixea.com/research/multi-view-coding-thesisch2.html
[Accessed 4 Juli 2022].

Azwandi, Y. & Efendi, J., 2004. *Orientasi dan Mobilitas.* Padang: Universitas Negeri Padang.

Basri, 2015. Blob Modification in Counting Vehicles using Gaussian Mixture Models Under Heavy Traffic. *ARPN Journal of Engineering and Applied Sciences,* 10(16), pp. 7157-7163.

Gong, F. & dkk, 2019. A Real-Time Fire Detection Method from Video with Multifeature Fusion. *Journal of Computational Intelligence and Neuroscience.*

Indrabayu, et al., 2020. Blob Adaptation Through Frames Analysis for Dynamic Fire Detection. *Bulletin of Electrical Engineering and Informatics,* pp. 2189-2197.

Indrabulan, T., 2016. *Perbandingan Metode Deteksi Objek Berbasis Video untuk Survei Arus Lalu Lintas,* Makassar: Universitas Hasanuddin.

Jain, A. K., 1986. *Fundamental of Digital Image Processing.* New Jersey: Prentice-Hall.

Kementerian Pendidikan, Kebudayaan, Riset, dan Teknologi Republik Indonesia, 2022. *KBBI Daring.* [Online]
Available at: https://kbbi.kemdikbud.go.id/
[Accessed Juli 2022].

Kiptiya, M., 2014. Pengaruh harapan terhadap kualitas hidup yang diperantarai dukungan sosial pada penyandang cacat netra Unit Pelaksana Teknis Rehabilitasi Sosial Cacat Netra Malang. *Health, Clinical and Counselling Psychology.*

Ladjamudin, A.-B. b., 2005. *Analisis dan Desain Sistem Informasi.* Yogyakarta: Graha Ilmu.

Liana, Y., 2012. *Pengertian Video dan Adobe Premiere Pro CS6.* s.l.:s.n.

Lucey, T., 2005. *Management Information Systems.* London: Letts Educational.

Lund University, 2020. *Lecture 1: The Pinhole Camera Model,* Scania: s.n.

Pengertian, T., 2013. *Temukan Pengertian.* [Online]
Available at: https://www.temukanpengertian.com/2013/08/pengertian-pengolahan-citra-digital.html
[Accessed 2 July 2022].

Pradana, S. Y. & dkk, 2018. Deteksi Titik Api Terpusat Menggunakan Kamera dengan Notifikasi Berbasis SMS Gateway pada Raspberry Pi. *Jurnal Pengembangan Teknologi Informasi dan Ilmu Komputer.*

Pratiwi, Y. S. & Rachmawati, M., 2016. Perancangan Pusat Komunitas Tunanetra. *Jurnal Sains dan Seni*, pp. 174-178.

Simon, H., 1969. *The Sciences of the Artificial.* Cambridge: MIT Press.

Sukabumi, D. K., 2017. *Teori Segitiga Api.* [Online]
Available at: https://dinasdamkar.sukabumikab.go.id/2017/12/15/teori-segitiga-api/

Sulistiyanti, S. R., Setyawan, F. A. & Komarudin, M., 2016. *Pengolahan Citra Dasar dan Contoh Penerapannya.* Yogyakarta: Teknosain.

Sunanto, J., 2005. *Potensi Anak Berkelainan Penglihatan.* Jakarta: Departemen Pendidikan Nasional.

T.S., T. A., 2019. *Perbandingan Model Warna RGB, HSL dan HSV Sebagai Fitur dalam Prediksi Cuaca pada Citra Langit menggunakan K-Means.* Bandung, s.n.

Techopedia, 2016. *Techopedia.* [Online]
Available at: https://www.techopedia.com/definition/788/binary-large-object-blob
[Accessed 4 Juli 2022].

Visco Technologies, 2021. *Blob Analysis.* [Online]
Available at: https://www.visco-tech.com/usa/technical/direction-presence/blob/

Woods, R. E. & Gonzales, R. C., 2008. *Digital Image Processing Third Edition.* New Jersey: Pearson Education.

Ya'acob, N. & dkk, 2020. Image Processing Based Forest Fire Detection using Infrared Camera. *Journal of Physics : Conference Series.*

Yunaeti, E. & Irviani, R., 2017. *Pengantar Sistem Informasi.* Yogyakarta: Andi.

Zebra Technologies Corp., 2022. *Zebra Aurora Vision.* [Online] Available at: https://docs.adaptive-vision.com/avl/machine_vision_guide/BlobAnalysis.html [Accessed 4 Juli 2022].

LAMPIRAN

Lampiran 1. Perpindahan Jarak Titik Pusat Objek Data

Keterangan:

- Garis datar (-): Jumlah *frame* yang berisi objek tidak mencapai 15
- Warna Merah: Memenuhi *threshold* jarak perpindahan api yaitu ≤ 40 dan jumlah *frame* yang memiliki objek ≥ 15

D01_A_TanpaK_TanpaL_KameraDiam_TanpaK_3m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	7	4	12	9	3	8	2	6	5	7	12	-	10	4	1
	2	12	-	-	-	9	-	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

D02_A_TanpaK_TanpaL_KameraDiam_TanpaK_4m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	11	4	12	8	5	6	2	6	7	6	8	15	31	3	7
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

D03_A_TanpaK_TanpaL_KameraDiam_TanpaK_5m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	8	2	8	7	8	3	4	5	6	3	8	3	5	5	5
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

D04_A_TanpaK_TanpaL_KameraDiam_TanpaK_6m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	3	7	13	16	15	4	13	-	-	4	10	4	1	2	2
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

D05_A_TanpaK_TanpaL_KameraBergerak_TanpaK_6m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	37	17	9	35	17	28	33	24	14	39	14	30	25	22	26
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

D06_K_Mob_Kuning_KameraDiam_KDiam_TanpaJ

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

D07_K_Mob_Kuning_KameraDiam_KBergerak_TanpaJ

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	-	-	-	-	-	-	-	-	-	-	67	-	-	-	-
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

D08_K_Mob_Kuning_KameraBergerak_KDiam_TanpaJ

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	32	12	8	14	34	36	34	34	18	19	21	32	12	13	29
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

D09_K_Mob_Kuning_KameraBergerak_KBergerak_TanpaJ

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2															
	3															

D10_K_Mob_Putih_KameraDiam_KDiam_TanpaJ

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2															
	3															

D11_K_Mob_Putih_KameraDiam_KBergerak_TanpaJ

20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2															
3															

D12_K_Mob_Putih_KameraBergerak_KDiam_TanpaJ

20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2															
3															

D13_K_Mob_Putih_KameraBergerak_KBergerak_TanpaJ

20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2															
3															

D14_K_Mot_Kuning_KameraDiam_KDiam_TanpaJ

20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2															
3															

D15_K_Mot_Kuning_KameraDiam_KBergerak_TanpaJ

20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2															
3															

D16_K_Mot_Kuning_KameraBergerak_KDiam_TanpaJ

20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2															
3															

D17_K_Mot_Kuning_KameraBergerak_KBergerak_TanpaJ

20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2															
3															

D18_K_Mot_Putih_KameraDiam_KDiam_TanpaJ

20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2															
3															

D19_K_Mot_Putih_KameraDiam_KBergerak_TanpaJ

20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2															
3															

D20_K_Mot_Putih_KameraBergerak_KDiam_TanpaJ

20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2															
3															

D21_K_Mot_Putih_KameraBergerak_KBergerak_TanpaJ

20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2															
3															

D22_AK_Mob_Kuning_KameraDiam_KDiam_3m

20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	4	4	16	11	11	12	6	10	7	21	3	1	9	3	2
2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

D23_AK_Mob_Kuning_KameraDiam_KDiam_4m

20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	6	5	1	7	2	4	2	4	4	5	3	4	2	4	2
2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3															

D24_AK_Mob_Kuning_KameraDiam_KDiam_5m

20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	4	5	1	4	1	6	1	2	4	3	2	4	2	4	2
2															
3															

D25_AK_Mob_Kuning_KameraDiam_KDiam_6m

20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	2	5	1	5	1	4	1	4	6	2	2	4	2	3	2
2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3															

D26_AK_Mob_Kuning_KameraDiam_KBergerak_3m

20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	9	18	26	9	5	1	4	6	5	4	7	58	-	14	3
2	-	-	-	-	-	-	-	-	-	46	72	-	-	-	-
3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

D27_AK_Mob_Kuning_KameraDiam_KBergerak_4m

20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	7	11	9	4	7	4	3	1	5	3	3	2	7	5	6
2	-	-	-	-	-	-	-	-	-	41	54	60	-	-	-
3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

D28_AK_Mob_Kuning_KameraDiam_KBergerak_5m

20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	6	12	11	5	5	1	4	1	4	2	5	8	8	6	5
2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

D29_AK_Mob_Kuning_KameraDiam_KBergerak_6m

20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	4	9	9	5	4	3	3	1	3	3	4	6	6	3	5
2	-	-	-	-	-	-	-	-	-	-	63	86	-	-	-
3															

D30_AK_Mob_Kuning_KameraBergerak_KDiam_6m

20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	4	16	21	4	46	24	14	19	26	30	22	28	33	10	20
2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3															

D31_AK_Mob_Kuning_KameraBergerak_KBergerak_6m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	11	29	32	10	16	38	13	39	33	18	20	12	44	19	40
	2															
	3															

D32_AK_Mob_Putih_KameraDiam_KDiam_3m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	6	16	16	1	5	11	2	10	9	14	15	12	1	-	18
	2	-	-	-	-	-	-	-	-	-	-	-	1	-	3	-
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	7															

D33_AK_Mob_Putih_KameraDiam_KDiam_4m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	18	10	9	15	24	9	10	10	9	11	7	18	13	5	3
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

D34_AK_Mob_Putih_KameraDiam_KDiam_5m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	9	10	10	4	8	8	9	9	7	5	8	2	5	8	8
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3															

D35_AK_Mob_Putih_KameraDiam_KDiam_6m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	9	6	7	6	5	9	4	5	6	2	4	9	1	4	7
	2															
	3															

D36_AK_Mob_Putih_KameraDiam_KBergerak_3m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	7	11	2	10	14	6	8	5	4	4	3	4	6	9	14
	2	-	-	-	-	-	-	-	-	4	-	-	-	1	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

D37_AK_Mob_Putih_KameraDiam_KBergerak_4m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	2	4	3	4	6	5	6	2	3	6	5	6	6	7	5
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3															

D38_AK_Mob_Putih_KameraDiam_KBergerak_5m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	8	4	5	14	6	7	6	1	3	4	4	4	3	17	4
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
	3															

D39_AK_Mob_Putih_KameraDiam_KBergerak_6m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	5	6	2	6	4	5	3	8	3	1	9	10	7	6	6
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3															

D40_AK_Mob_Putih_KameraBergerak_KDiam_6m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	3	3	9	52	19	31	32	15	55	28	5	16	47	21	5
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

D41_AK_Mob_Putih_KameraBergerak_KBergerak_6m

20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	43	24	51	21	29	21	37	23	9	22	23	17	33	22	36
2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3															

D42_AK_Mot_Kuning_KameraDiam_KDiam_3m

20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	5	2	9	11	10	7	13	19	2	3	4	3	12	7	8
2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

D43_AK_Mot_Kuning_KameraDiam_KDiam_4m

20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	17	3	2	1	6	17	18	19	19	13	6	13	7	1	4
2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

D44_AK_Mot_Kuning_KameraDiam_KDiam_5m

20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	8	11	12	3	7	7	25	18	9	7	9	2	9	4	9
2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3															

D45_AK_Mot_Kuning_KameraDiam_KDiam_6m

20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	9	4	3	3	2	9	4	12	-	2	6	5	3	10	3
2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	-	-	-	-	-	-	-	-	10	-	-	-	-	-	-

D46_AK_Mot_Kuning_KameraDiam_KBergerak_3m

20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	22	11	-	-	56	13	17	6	6	-	21	14	25	14	37
2	-	-	19	-	-	-	-	-	-	-	-	-	-	-	-
3	-	-	-	-	-	-	-	-	-	21	-	-	-	-	-
4	18	-	-	-	-	-	-	-	2	6	21	-	-	-	-
5	-	-	-	-	-	-	-	5	-	-	-	-	-	-	23
6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-
10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

D47_AK_Mot_Kuning_KameraDiam_KBergerak_4m

20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	39	-	15	-	5	4	9	4	4	-	11	-	14	-	17
2	-	-	-	-	-	-	-	-	-	7	-	-	-	-	-
3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

D48_AK_Mot_Kuning_KameraDiam_KBergerak_5m

20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	2	1	9	4	5	7	5	6	6	3	5	14	-	12	-
2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3															

D49_AK_Mot_Kuning_KameraDiam_KBergerak_6m

20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	9	8	8	8	3	2	12	4	4	4	2	-	4	-	-
2															
3															

D50_AK_Mot_Kuning_KameraBergerak_KDiam_6m

20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	13	20	11	24	23	43	7	27	46	47	18	42	28	16	30
2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

D51_AK_Mot_Kuning_KameraBergerak_KBergerak_6m

20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	12	37	4	26	21	27	18	22	20	19	33	55	19	23	24
2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

D52_AK_Mot_Putih_KameraDiam_KDiam_3m

20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	4	17	6	4	11	11	22	6	10	7	4	2	5	14	9
2	-	-	6	6	15	12	20	10	4	9	6	4	3	16	8
3	-	-	-	-	-	-	-	-	-	-	-	4	-	-	-

D53_AK_Mot_Putih_KameraDiam_KDiam_4m

20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	5	6	4	8	12	10	6	6	4	6	3	14	8	8	2
2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

D54_AK_Mot_Putih_KameraDiam_KDiam_5m

20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	2	3	8	6	5	1	5	7	1	3	4	3	3	9	13
2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3															

D55_AK_Mot_Putih_KameraDiam_KDiam_6m

20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	7	1	3	3	6	5	1	6	4	4	3	2	13	6	11
2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

D56_AK_Mot_Putih_KameraDiam_KBergerak_3m

20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	13	4	1	5	4	4	16	8	9	11	2	-	-	-	-
2	-	-	-	-	4	-	-	-	-	1	-	6	-	-	-
3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12
4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

D57_AK_Mot_Putih_KameraDiam_KBergerak_4m

20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	11	-	12	12	7	12	4	11	11	-	-	9	12	7	8
2	-	-	-	-	-	-	-	-	-	-	7	-	-	-	-
3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

D58_AK_Mot_Putih_KameraDiam_KBergerak_5m

20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	1	5	8	6	20	15	3	-	5	3	12	7	9	-	-
2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3

D59_AK_Mot_Putih_KameraDiam_KBergerak_6m

20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	6	8	5	9	18	12	8	3	-	-	-	7	1	14	4
2															
3															

D60_AK_Mot_Putih_KameraBergerak_KDiam_6m

20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	7	23	29	5	25	33	25	30	5	33	39	25	26	11	43
2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

D61_AK_Mot_Putih_KameraBergerak_KBergerak_6m

20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	20	17	19	43	10	42	28	21	40	22	32	10	44	25	32
2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5															
6															

Lampiran 2. Jumlah Perubahan Area Objek Data

Keterangan:

- Garis datar (-): Jumlah *frame* yang berisi objek tidak mencapai 15
- Warna Merah: Memenuhi *threshold* perubahan area api yaitu > 50 dan jumlah *frame* yang memiliki objek ≥ 15

D01_A_TanpaK_TanpaL_KameraDiam_TanpaK_3m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	146	81	86	118	101	85	141	111	91	126	94	92	88	77	54
	2	275	-	-	-	111	-	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

D02_A_TanpaK_TanpaL_KameraDiam_TanpaK_4m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	243	294	159	309	216	224	298	176	169	273	175	207	205	192	216
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

D03_A_TanpaK_TanpaL_KameraDiam_TanpaK_5m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	425	272	267	184	320	417	257	250	276	369	368	284	290	290	161
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3															

D04_A_TanpaK_TanpaL_KameraDiam_TanpaK_6m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	365	431	391	580	269	474	417	-	-	377	360	157	173	162	255
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

D05_A_TanpaK_TanpaL_KameraBergerak_TanpaK_6m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	234	256	190	172	153	154	208	188	120	184	196	264	173	164	122
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3															

D06_K_Mob_Kuning_KameraDiam_KDiam_TanpaJ

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2															
	3															

D07_K_Mob_Kuning_KameraDiam_KBergerak_TanpaJ

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	-	-	-	-	-	-	-	-	-	-	187	-	-	-	-
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3															

D08_K_Mob_Kuning_KameraBergerak_KDiam_TanpaJ

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	15	16	12	15	13	13	14	15	11	16	11	14	18	17	13
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

D09_K_Mob_Kuning_KameraBergerak_KBergerak_TanpaJ

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2															
	3															

D10_K_Mob_Putih_KameraDiam_KDiam_TanpaJ

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2															
	3															

D11_K_Mob_Putih_KameraDiam_KBergerak_TanpaJ

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2															
	3															

D12_K_Mob_Putih_KameraBergerak_KDiam_TanpaJ

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2															
	3															

D13_K_Mob_Putih_KameraBergerak_KBergerak_TanpaJ

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2															
	3															

D14_K_Mot_Kuning_KameraDiam_KDiam_TanpaJ

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2															
	3															

D15_K_Mot_Kuning_KameraDiam_KBergerak_TanpaJ

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2															
	3															

D16_K_Mot_Kuning_KameraBergerak_KDiam_TanpaJ

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2															
	3															

D17_K_Mot_Kuning_KameraBergerak_KBergerak_TanpaJ

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2															
	3															

D18_K_Mot_Putih_KameraDiam_KDiam_TanpaJ

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2															
	3															

D19_K_Mot_Putih_KameraDiam_KBergerak_TanpaJ

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2															
	3															

D20_K_Mot_Putih_KameraBergerak_KDiam_TanpaJ

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2															
	3															

D21_K_Mot_Putih_KameraBergerak_KBergerak_TanpaJ

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2															
	3															

D22_AK_Mob_Kuning_KameraDiam_KDiam_3m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	322	205	194	109	130	177	110	182	156	380	248	247	257	311	521
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

D23_AK_Mob_Kuning_KameraDiam_KDiam_4m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	119	132	89	132	87	142	89	111	80	85	96	89	109	91	93
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3															

D24_AK_Mob_Kuning_KameraDiam_KDiam_5m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	121	145	119	91	137	129	100	116	78	107	91	90	108	106	124
	2															
	3															

D25_AK_Mob_Kuning_KameraDiam_KDiam_6m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	118	93	107	90	100	121	138	111	123	108	147	87	93	110	105
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3															

D26_AK_Mob_Kuning_KameraDiam_KBergerak_3m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	56	85	149	75	203	133	172	113	206	115	109	234	-	170	159
	2	-	-	-	-	-	-	-	-	-	808	352	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

D27_AK_Mob_Kuning_KameraDiam_KBergerak_4m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	95	126	83	113	89	98	102	83	96	102	90	94	173	178	80
	2	-	-	-	-	-	-	-	-	-	370	310	327	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

D28_AK_Mob_Kuning_KameraDiam_KBergerak_5m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	78	38	51	53	38	92	78	93	105	103	104	92	125	79	112
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

D29_AK_Mob_Kuning_KameraDiam_KBergerak_6m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	60	43	51	56	55	98	105	109	120	96	100	97	177	109	84
	2	-	-	-	-	-	-	-	-	-	-	152	141	-	-	-
	3															

D30_AK_Mob_Kuning_KameraBergerak_KDiam_6m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	121	114	64	102	86	93	91	74	83	69	66	145	81	72	86
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3															

D31_AK_Mob_Kuning_KameraBergerak_KBergerak_6m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	78	58	68	111	86	77	83	103	114	76	88	110	102	107	90
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3															

D32_AK_Mob_Putih_KameraDiam_KDiam_3m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	280	203	149	135	111	147	67	212	119	180	195	127	241	158	182
	2	-	-	-	-	-	-	-	-	-	-	-	32	-	55	-
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

D33_AK_Mob_Putih_KameraDiam_KDiam_4m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	143	123	135	155	188	175	202	168	197	140	190	210	181	188	271
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

D34_AK_Mob_Putih_KameraDiam_KDiam_5m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	194	100	126	132	158	102	124	124	162	135	163	134	117	158	203
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3															

D35_AK_Mob_Putih_KameraDiam_KDiam_6m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	104	146	125	149	125	94	81	186	132	130	135	136	138	90	87
	2															
	3															

D36_AK_Mob_Putih_KameraDiam_KBergerak_3m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	105	89	88	74	73	63	87	66	62	69	82	57	65	62	84
	2	-	-	-	-	-	-	-	-	71	-	-	-	55	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

D37_AK_Mob_Putih_KameraDiam_KBergerak_4m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	64	67	70	90	82	87	76	44	71	72	96	104	79	73	64
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3															

D38_AK_Mob_Putih_KameraDiam_KBergerak_5m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	93	76	62	91	74	120	78	85	99	84	60	86	87	89	201
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	121
	3															

D39_AK_Mob_Putih_KameraDiam_KBergerak_6m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	90	89	88	75	78	81	116	77	81	112	71	71	148	93	127
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3															

D40_AK_Mob_Putih_KameraBergerak_KDiam_6m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	111	75	133	101	81	75	89	99	56	143	78	201	192	160	104
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

D41_AK_Mob_Putih_KameraBergerak_KBergerak_6m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	136	179	130	177	215	129	98	165	114	117	137	152	118	126	76
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3															

D42_AK_Mot_Kuning_KameraDiam_KDiam_3m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	266	186	364	313	315	258	212	196	199	136	188	148	210	187	233
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

D43_AK_Mot_Kuning_KameraDiam_KDiam_4m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	246	169	203	289	198	385	191	237	225	258	301	252	211	150	322
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

D44_AK_Mot_Kuning_KameraDiam_KDiam_5m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	141	167	175	153	116	195	159	201	170	138	253	272	247	203	215
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3															

D45_AK_Mot_Kuning_KameraDiam_KDiam_6m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	262	167	214	250	225	221	301	164	-	231	296	302	301	394	213
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4	-	-	-	-	-	-	-	-	122	-	-	-	-	-	-

D46_AK_Mot_Kuning_KameraDiam_KBergerak_3m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	340	402	-	-	808	922	666	402	495	-	639	774	516	427	628
	2	-	-	197	-	-	-	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	641	-	-	-	-	-
	4	237	-	-	-	-	-	-	-	94	100	395	-	-	-	-
	5	-	-	-	-	-	-	-	114	-	-	-	-	-	-	360
	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	9	-	-	-	83	-	-	-	-	-	-	-	-	-	-	-
	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

D47_AK_Mot_Kuning_KameraDiam_KBergerak_4m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	453	-	627	-	398	347	409	340	324	-	246	-	397	-	420
	2	-	-	-	-	-	-	-	-	-	473	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

D48_AK_Mot_Kuning_KameraDiam_KBergerak_5m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	207	187	153	268	188	186	246	178	203	220	189	179	-	375	-
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3															

D49_AK_Mot_Kuning_KameraDiam_KBergerak_6m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	286	255	241	190	218	316	280	221	255	346	318	-	196	-	-
	2															
	3															

D50_AK_Mot_Kuning_KameraBergerak_KDiam_6m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	190	250	260	276	283	267	311	340	259	236	234	230	178	178	114
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

D51_AK_Mot_Kuning_KameraBergerak_KBergerak_6m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	288	427	274	230	264	309	280	239	372	513	473	215	342	401	222
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

D52_AK_Mot_Putih_KameraDiam_KDiam_3m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	118	191	180	110	131	93	69	154	131	125	98	93	139	117	125
	2	-	-	63	55	56	152	104	144	131	91	166	133	113	139	209
	3	-	-	-	-	-	-	-	-	-	-	-	293	-	-	-

D53_AK_Mot_Putih_KameraDiam_KDiam_4m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	139	171	170	138	227	188	212	173	164	99	236	336	186	158	207
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

D54_AK_Mot_Putih_KameraDiam_KDiam_5m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	105	151	137	135	237	158	214	143	156	325	277	204	221	188	217
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3															

D55_AK_Mot_Putih_KameraDiam_KDiam_6m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	390	180	149	156	153	168	152	159	154	186	156	178	188	229	269
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

D56_AK_Mot_Putih_KameraDiam_KBergerak_3m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	355	446	433	395	326	406	489	198	311	243	410	-	-	-	-
	2	-	-	-	-	354	-	-	-	-	340	-	457	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	510
	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

D57_AK_Mot_Putih_KameraDiam_KBergerak_4m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	662	-	318	542	389	431	252	648	736	-	-	486	477	416	351
	2	-	-	-	-	-	-	-	-	-	-	426	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

D58_AK_Mot_Putih_KameraDiam_KBergerak_5m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	188	313	216	249	300	186	257	175	375	179	493	298	351	-	-
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	244

D59_AK_Mot_Putih_KameraDiam_KBergerak_6m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	298	252	474	541	469	355	360	670	-	-	-	382	454	400	349
	2															
	3															

D60_AK_Mot_Putih_KameraBergerak_KDiam_6m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	125	118	265	218	321	214	81	104	107	108	201	103	131	156	101
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

D61_AK_Mot_Putih_KameraBergerak_KBergerak_6m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	186	161	259	201	164	219	168	201	167	161	184	156	175	176	133
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	5															
	6															

Lampiran 3. Jumlah Frame yang Berhasil Mendeteksi Objek

Keterangan:

- Garis datar (-): Tidak terdapat objek sepanjang 20 *frame*
- Warna Merah: Memenuhi *threshold* jarak perpindahan api yaitu ≤ 40, *threshold* perubahan area api yaitu > 50 dan jumlah *frame* yang memiliki objek ≥ 15
- Warna Merah Muda: Objek api yang tidak memenuhi syarat api
- Warna Kuning: Objek cahaya lampu kendaraan

D01_A_TanpaK_TanpaL_KameraDiam_TanpaK_3m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
	2	15	10	9	7	15	13	9	9	8	2	10	9	6	10	11
	3	-	1	-	-	-	1	-	1	-	1	1	1	-	-	-
	4	-	-	-	-	-	-	1	-	-	-	1	-	-	-	-

D02_A_TanpaK_TanpaL_KameraDiam_TanpaK_4m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	20	20	20	20	20	20	15	20	20	20	20	20	20	20	20
	2	1	1	-	1	1	-	6	-	3	2	1	-	3	-	1
	3	-	-	-	-	1	-	1	-	-	2	-	-	1	-	-

D03_A_TanpaK_TanpaL_KameraDiam_TanpaK_5m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
	2	1	-	-	-	-	1	-	-	-	4	-	-	-	-	-
	3															

D04_A_TanpaK_TanpaL_KameraDiam_TanpaK_6m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	20	20	20	20	20	20	20	6	14	20	20	20	20	20	20
	2	-	1	-	1	-	1	3	2	6	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	13	-	-	-	-	-	-	-
	4	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-

D05_A_TanpaK_TanpaL_KameraBergerak_TanpaK_6m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
	2	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-
	3															

D06_K_Mob_Kuning_KameraDiam_KDiam_TanpaJ

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2															
	3															

D07_K_Mob_Kuning_KameraDiam_KBergerak_TanpaJ

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	-	-	-	-	-	-	-	-	3	2	16	-	-	-	-
	2	-	-	-	-	-	-	-	-	3	2	-	-	-	-	-
	3															

D08_K_Mob_Kuning_KameraBergerak_KDiam_TanpaJ

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
	2	2	-	-	4	-	-	-	-	-	-	1	1	1	2	-
	3	-	-	-	-	1	-	-	-	-	-	-	-	6	-	-

D09_K_Mob_Kuning_KameraBergerak_KBergerak_TanpaJ

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	-	-	-	-	-	-	-	-	-	-	-	-	-	7	-
	2															
	3															

D10_K_Mob_Putih_KameraDiam_KDiam_TanpaJ

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2															
	3															

D11_K_Mob_Putih_KameraDiam_KBergerak_TanpaJ

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
	2															
	3															

D12_K_Mob_Putih_KameraBergerak_KDiam_TanpaJ

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2															
	3															

D13_K_Mob_Putih_KameraBergerak_KBergerak_TanpaJ

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2															
	3															

D14_K_Mot_Kuning_KameraDiam_KDiam_TanpaJ

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	-	-	-	-	-	-	-	-	-	-	-	-	5	7	-
	2															
	3															

D15_K_Mot_Kuning_KameraDiam_KBergerak_TanpaJ

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2															
	3															

D16_K_Mot_Kuning_KameraBergerak_KDiam_TanpaJ

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-
	2															
	3															

D17_K_Mot_Kuning_KameraBergerak_KBergerak_TanpaJ

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2															
	3															

D18_K_Mot_Putih_KameraDiam_KDiam_TanpaJ

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2															
	3															

D19_K_Mot_Putih_KameraDiam_KBergerak_TanpaJ

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
	2															
	3															

D20_K_Mot_Putih_KameraBergerak_KDiam_TanpaJ

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2															
	3															

D21_K_Mot_Putih_KameraBergerak_KBergerak_TanpaJ

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	-	-	-	-	-	-	-	-	-	-	-	6	6	-	-
	2															
	3															

D22_AK_Mob_Kuning_KameraDiam_KDiam_3m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
	2	1	-	5	1	-	2	-	-	1	1	4	5	5	-	3
	3	1	-	-	-	-	-	1	-	-	1	1	-	-	1	-
	4	-	3	-	-	-	-	-	-	-	-	-	1	-	-	-

D23_AK_Mob_Kuning_KameraDiam_KDiam_4m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
	2	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
	3															

D24_AK_Mob_Kuning_KameraDiam_KDiam_5m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
	2															
	3															

D25_AK_Mob_Kuning_KameraDiam_KDiam_6m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
	2	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
	3															

D26_AK_Mob_Kuning_KameraDiam_KBergerak_3m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	20	20	20	20	20	20	20	20	20	20	20	16	10	20	20
	2	-	-	3	-	-	-	-	-	1	18	19	1	11	1	-
	3	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-
	4	-	-	-	-	-	-	-	-	-	1	-	9	-	-	-

D27_AK_Mob_Kuning_KameraDiam_KBergerak_4m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
	2	-	-	-	-	-	-	-	-	11	18	20	18	-	1	-
	3	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-

D28_AK_Mob_Kuning_KameraDiam_KBergerak_5m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
	2	-	-	-	-	-	-	-	-	-	6	10	10	-	-	-
	3	-	-	-	-	-	-	-	-	-	4	10	-	-	-	-

D29_AK_Mob_Kuning_KameraDiam_KBergerak_6m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
	2	-	-	-	-	-	-	-	-	-	-	18	15	-	-	-
	3															

D30_AK_Mob_Kuning_KameraBergerak_KDiam_6m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
	2	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
	3															

D31_AK_Mob_Kuning_KameraBergerak_KBergerak_6m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
	2															
	3															

D32_AK_Mob_Putih_KameraDiam_KDiam_3m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
	2	6	4	4	3	1	1	-	7	5	9	4	15	10	15	11
	3	2	-	1	7	3	7	1	-	-	-	2	13	-	-	6
	4	1	-	5	4	-	3	-	-	-	-	-	1	2	-	-
	5	-	-	-	-	-	-	1	-	-	-	-	-	1	-	-
	6	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
	7															

D33_AK_Mob_Putih_KameraDiam_KDiam_4m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
	2	-	-	1	1	-	3	2	-	1	-	1	6	3	7	8
	3	-	-	1	-	1	-	1	-	-	-	3	-	-	1	1
	4	-	-	-	-	2	-	-	-	-	-	-	-	-	-	1

D34_AK_Mob_Putih_KameraDiam_KDiam_5m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	2
	3															

D35_AK_Mob_Putih_KameraDiam_KDiam_6m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
	2															
	3															

D36_AK_Mob_Putih_KameraDiam_KBergerak_3m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
	2	2	1	8	8	10	3	7	1	16	7	10	6	17	11	11
	3	10	6	-	-	-	-	1	-	-	-	1	-	1	-	1
	4	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1

D37_AK_Mob_Putih_KameraDiam_KBergerak_4m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
	2	1	-	-	-	-	1	1	-	-	-	5	1	-	-	-
	3															

D38_AK_Mob_Putih_KameraDiam_KBergerak_5m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	1	16
	3															

D39_AK_Mob_Putih_KameraDiam_KBergerak_6m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3															

D40_AK_Mob_Putih_KameraBergerak_KDiam_6m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
	2	-	-	-	-	-	1	1	-	1	-	-	1	-	1	-
	3	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-

D41_AK_Mob_Putih_KameraBergerak_KBergerak_6m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
	2	-	-	-	-	-	-	-	1	-	-	-	-	2	2	-
	3															

D42_AK_Mot_Kuning_KameraDiam_KDiam_3m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
	2	2	1	1	2	4	-	1	2	7	-	2	-	1	1	5
	3	2	-	1	1	-	-	2	4	2	1	-	1	-	2	-
	4	-	-	1	-	3	-	-	-	6	-	-	-	-	1	-
	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1

D43_AK_Mot_Kuning_KameraDiam_KDiam_4m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
	2	1	-	1	-	-	1	3	-	1	1	2	4	2	-	1
	3	-	-	-	1	-	3	-	-	-	-	1	-	-	-	1
	4	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-

D44_AK_Mot_Kuning_KameraDiam_KDiam_5m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
	2	-	1	-	-	-	-	-	2	-	-	-	-	-	-	-
	3															

D45_AK_Mot_Kuning_KameraDiam_KDiam_6m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	20	20	20	20	20	20	20	20	5	15	20	20	20	20	20
	2	1	-	-	-	-	-	1	-	1	4	-	-	2	1	-
	3	1	-	-	-	-	-	-	-	1	-	-	-	-	1	-
	4	-	-	-	-	-	-	-	-	16	3	-	-	-	-	-

D46_AK_Mot_Kuning_KameraDiam_KBergerak_3m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	20	20	9	3	19	19	19	19	20	10	15	20	20	20	20
	2	3	8	15	4	11	7	3	2	1	4	6	2	1	7	1
	3	2	4	13	1	2	1	4	7	4	19	6	1	4	3	-
	4	18	1	1	13	1	8	11	2	20	20	17	3	1	6	7
	5	10	10	6	2	3	2	5	18	1	3	1	1	1	11	15
	6	1	1	2	6	1	4	1	5	8	1	-	2	3	-	1
	7	2	4	5	2	3	4	3	2	3	1	6	3	-	1	2
	8	1	1	2	4	10	1	1	3	2	2	2	1	-	1	2
	9	2	3	4	16	2	2	6	1	-	4	1	1	-	-	6
	10	-	1	-	3	5	-	8	-	1	1	-	1	-	-	1
	11	-	4	-	1	1	-	1	1	1	-	1	2	-	-	2
	12	-	1	-	-	1	5	1	1	-	-	1	1	-	-	1
	13	-	-	-	-	1	-	-	3	-	-	-	1	-	-	-
	14	-	-	-	-	1	-	-	-	-	-	-	-	2	-	-
	15	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-

D47_AK_Mot_Kuning_KameraDiam_KBergerak_4m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	20	11	17	11	19	20	20	16	17	4	20	12	19	2	15
	2	2	10	2	9	2	1	-	2	4	16	-	6	-	4	10
	3	2	3	3	-	-	-	-	3	-	-	-	4	-	2	2

D48_AK_Mot_Kuning_KameraDiam_KBergerak_5m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	20	20	20	20	20	20	16	18	18	19	19	19	1	4	1
	2	-	-	-	-	-	-	-	1	9	-	-	-	-	-	-
	3															

D49_AK_Mot_Kuning_KameraDiam_KBergerak_6m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	20	19	16	17	16	17	19	19	18	19	16	13	18	6	2
	2															
	3															

D50_AK_Mot_Kuning_KameraBergerak_KDiam_6m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
	2	-	-	-	1	-	-	-	1	-	-	-	1	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-

D51_AK_Mot_Kuning_KameraBergerak_KBergerak_6m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
	2	-	5	-	-	-	1	2	5	2	11	6	2	1	-	2
	3	-	-	-	-	-	-	-	-	3	3	-	1	1	-	1
	4	-	-	-	-	-	-	-	-	2	2	5	-	1	2	-
	5	-	-	-	-	-	-	-	-	2	4	2	-	-	-	-
	6	-	-	-	-	-	-	-	-	-	-	-	5	-	-	-

D52_AK_Mot_Putih_KameraDiam_KDiam_3m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
	2	14	13	18	18	18	20	20	20	20	20	20	20	20	20	20
	3	-	-	2	-	-	-	-	4	5	3	2	19	13	12	9

D53_AK_Mot_Putih_KameraDiam_KDiam_4m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
	2	2	6	9	7	5	9	7	1	2	3	2	7	2	-	5
	3	-	-	-	-	1	-	-	3	-	-	2	8	1	2	1

D54_AK_Mot_Putih_KameraDiam_KDiam_5m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
	2	1	2	2	1	7	3	8	1	1	4	6	6	12	2	2
	3															

D55_AK_Mot_Putih_KameraDiam_KDiam_6m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
	2	7	-	-	-	2	-	-	-	-	-	-	14	8	5	4
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1

D56_AK_Mot_Putih_KameraDiam_KBergerak_3m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	19	19	20	20	20	20	20	20	20	20	20	12	3	12	9
	2	4	-	10	13	16	12	5	9	9	15	7	20	9	8	3
	3	2	1	-	-	1	-	-	1	1	3	1	1	11	1	19
	4	-	1	-	-	-	-	-	-	2	-	-	4	1	11	2
	5	-	-	-	-	-	-	-	-	-	-	-	-	13	-	2

D57_AK_Mot_Putih_KameraDiam_KBergerak_4m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	19	4	16	19	20	20	20	20	19	9	2	15	20	20	20
	2	2	6	5	1	-	1	-	-	2	10	20	6	-	1	-
	3	-	11	-	1	-	-	-	-	-	6	1	1	-	-	-
	4	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-

D58_AK_Mot_Putih_KameraDiam_KBergerak_5m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	20	20	20	20	20	20	20	20	20	20	18	20	19	9	8
	2	-	-	-	-	-	-	-	-	11	1	1	-	-	4	2
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5

D59_AK_Mot_Putih_KameraDiam_KBergerak_6m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	20	20	20	17	17	17	17	19	14	12	7	18	20	20	18
	2															
	3															

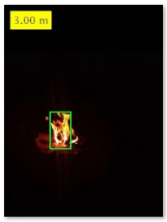
D60_AK_Mot_Putih_KameraBergerak_KDiam_6m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
	2	10	1	2	4	5	9	-	-	2	-	2	-	3	4	-
	3	-	-	-	4	4	5	-	-	-	-	-	-	-	-	3

D61_AK_Mot_Putih_KameraBergerak_KBergerak_6m

	20 Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Objek	1	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
	2	-	-	-	-	-	-	-	-	-	2	1	-	-	5	9
	3	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
	4	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
	5															
	6															

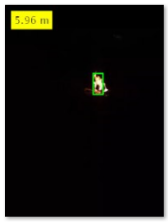
Lampiran 4. Hasil deteksi objek api dan estimasi jarak api



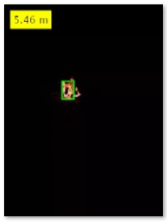
D01_A_TanpaK_TanpaL_KameraDiam_TanpaK_3m_254.JPG

D02_A_TanpaK_TanpaL_KameraDiam_TanpaK_4m_104.JPG

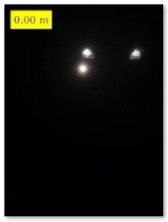
D03_A_TanpaK_TanpaL_KameraDiam_TanpaK_5m_141.JPG



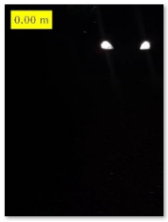
D04_A_TanpaK_TanpaL_KameraDiam_TanpaK_6m_106.JPG



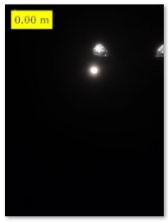
D05_A_TanpaK_TanpaL_KameraBergerak_TanpaK_6m_195.JPG



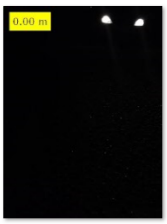
D06_K_Mob_Kuning_KameraDiam_KDiam_TanpaJ_39.JPG



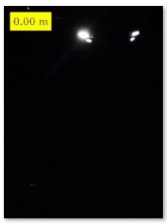
D07_K_Mob_Kuning_KameraDiam_KBergerak_TanpaJ_171.JPG



D08_K_Mob_Kuning_KameraBergerak_KDiam_TanpaJ_206.JPG

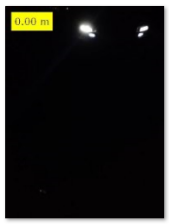


D09_K_Mob_Kuning_KameraBergerak_KBergerak_TanpaJ_227.JPG



D10_K_Mob_Putih_KameraDiam_KDiam_TanpaJ_27.JPG

D11_K_Mob_Putih_KameraDiam_KBergerak_TanpaJ_106.JPG

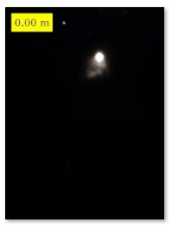


D12_K_Mob_Putih_KameraBergerak_KDiam_TanpaJ_116.JPG

D13_K_Mob_Putih_KameraBergerak_KBergerak_TanpaJ_118.JPG

D14_K_Mot_Kuning_KameraDiam_KDiam_TanpaJ_28.JPG

D15_K_Mot_Kuning_KameraDiam_KBergerak_TanpaJ_95.JPG

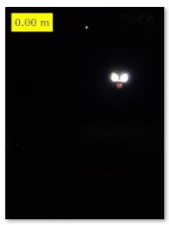


D16_K_Mot_Kuning_KameraBergerak_KDiam_TanpaJ_62.JPG

D17_K_Mot_Kuning_KameraBergerak_KBergerak_TanpaJ_261.JPG

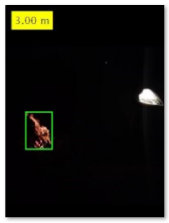
D18_K_Mot_Putih_KameraDiam_KDiam_TanpaJ_30.JPG

D19_K_Mot_Putih_KameraDiam_KBergerak_TanpaJ_40.JPG

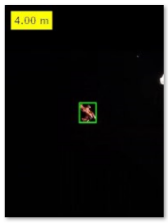


D20_K_Mot_Putih_KameraBergerak_KDiam_TanpaJ_31.JPG

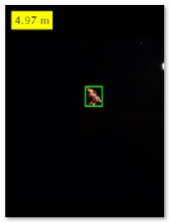
D21_K_Mot_Putih_KameraBergerak_KBergerak_TanpaJ_140.JPG



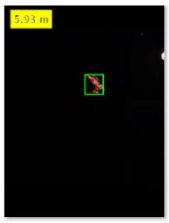
D22_AK_Mob_Kuning_KameraDiam_KDiam_3m_190.JPG



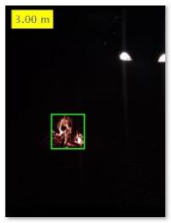
D23_AK_Mob_Kuning_KameraDiam_KDiam_4m_66.JPG



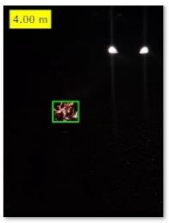
D24_AK_Mob_Kuning_KameraDiam_KDiam_5m_87.JPG



D25_AK_Mob_Kuning_KameraDiam_KDiam_6m_79.JPG

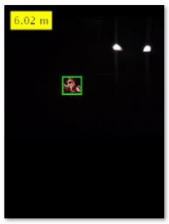


D26_AK_Mob_Kuning_KameraDiam_KBergerak_3m_186.JPG



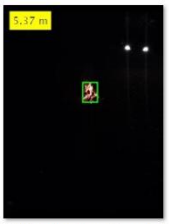
D27_AK_Mob_Kuning_KameraDiam_KBergerak_4m_173.JPG

D28_AK_Mob_Kuning_KameraDiam_KBergerak_5m_174.JPG



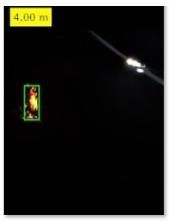
D29_AK_Mob_Kuning_KameraDiam_KBergerak_6m_208.JPG

D30_AK_Mob_Kuning_KameraBergerak_KDiam_6m_37.JPG

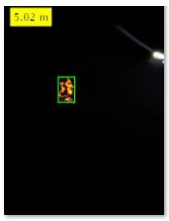


D31_AK_Mob_Kuning_KameraBergerak_KBergerak_6m_81.JPG

D32_AK_Mob_Putih_KameraDiam_KDiam_3m_219.JPG



D33_AK_Mob_Putih_KameraDiam_KDiam_4m_268.JPG



D34_AK_Mob_Putih_KameraDiam_KDiam_5m_53.JPG

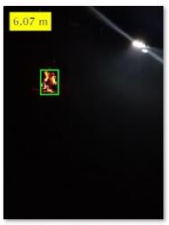
D35_AK_Mob_Putih_KameraDiam_KDiam_6m_276.JPG

D36_AK_Mob_Putih_KameraDiam_KBergerak_3m_98.JPG

D37_AK_Mob_Putih_KameraDiam_KBergerak_4m_80.JPG

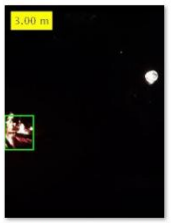
D38_AK_Mob_Putih_KameraDiam_KBergerak_5m_87.JPG

D39_AK_Mob_Putih_KameraDiam_KBergerak_6m_204.JPG



D40_AK_Mob_Putih_KameraBergerak_KDiam_6m_36.JPG

D41_AK_Mob_Putih_KameraBergerak_KBergerak_6m_199.JPG



D42_AK_Mot_Kuning_KameraDiam_KDiam_3m_111.JPG

D43_AK_Mot_Kuning_KameraDiam_KDiam_4m_202.JPG

D44_AK_Mot_Kuning_KameraDiam_KDiam_5m_59.JPG

D45_AK_Mot_Kuning_KameraDiam_KDiam_6m_280.JPG

D46_AK_Mot_Kuning_KameraDiam_KBergerak_3m_291.JPG

D47_AK_Mot_Kuning_KameraDiam_KBergerak_4m_102.JPG

D48_AK_Mot_Kuning_KameraDiam_KBergerak_5m_38.JPG

D49_AK_Mot_Kuning_KameraDiam_KBergerak_6m_82.JPG

D50_AK_Mot_Kuning_KameraBergerak_KDiam_6m_227.JPG

D51_AK_Mot_Kuning_KameraBergerak_KBergerak_6m_62.JPG

D52_AK_Mot_Putih_KameraDiam_KDiam_3m_237.JPG

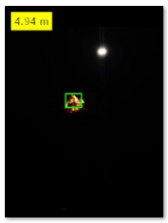
D53_AK_Mot_Putih_KameraDiam_KDiam_4m_150.JPG

D54_AK_Mot_Putih_KameraDiam_KDiam_5m_107.JPG

D55_AK_Mot_Putih_KameraDiam_KDiam_6m_155.JPG

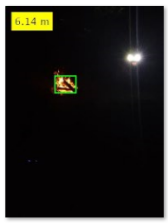
D56_AK_Mot_Putih_KameraDiam_KBergerak_3m_133.JPG

D57_AK_Mot_Putih_KameraDiam_KBergerak_4m_65.JPG



D58_AK_Mot_Putih_KameraDiam_KBergerak_5m_90.JPG

D59_AK_Mot_Putih_KameraDiam_KBergerak_6m_96.JPG



D60_AK_Mot_Putih_KameraBergerak_KDiam_6m_99.JPG

D61_AK_Mot_Putih_KameraBergerak_KBergerak_6m_51.JPG

Lampiran 5. Code

```
clear; clc; workspace;
%% Setup
% add Path
addpath('D:\TUGAS\KULIAH\UNHAS\SEMESTER 7\TUGAS AKHIR\DATA\Source\Video Clip');
startingFolder = ['D:\TUGAS\KULIAH\UNHAS\SEMESTER 7\' ...
    'TUGAS AKHIR\DATA\Source\Video Clip'];
if ~exist(startingFolder,'dir')
    startingFolder = pwd;
end

%Get the name of the file that the user wants to use.
defaultFileName = fullfile(startingFolder, '*.*');
[baseFileName, folder] = uigetfile(defaultFileName, 'Select a file');
if baseFileName == 0
    % User clicked the cancel button.
    return;
end
fullSourceFileName = fullfile(folder, baseFileName);

% create destination filename
destinationFolder = 'D:\TUGAS\KULIAH\UNHAS\SEMESTER 7\TUGAS AKHIR\DATA\Frames';
if ~exist(destinationFolder, 'dir')
    mkdir(destinationFolder);
end

% Strip off extenstion from input file
[sourceFodler, baseFileNameNoExtenstion, ext] = fileparts(fullSourceFileName);

DATAVIDEO = baseFileName;

% create object to read video frames from the file
vidReader = vision.VideoFileReader(DATAVIDEO);
vidReader.VideoOutputDataType = 'double';

% Create a video player object to play the video file.
vidPlayer = vision.VideoPlayer('Position', [0 10 480 720], 'Name', ...
    baseFileNameNoExtenstion);

% create structural element for morphological operation  to remove
% disturbances
se90 = strel('line', 2, 90);
se0 = strel('line', 2, 0);
seD = strel('diamond',1); %diamond
```

```
area0 = 0; n = 1; m = 0;

%Variabel untuk mencatat perpindahan area frame setiap 20 frame
movingArea= zeros(5,1);

%Variabel untuk mencatat perpindahan titik pusat frame setiap 20 frame
movingCentroid = zeros(5,1);

%Variabel untuk menyimpan apakah blob dalam frame dideteksi sebagai api
detected = false(1,5);

%Variabel untuk menyimpan index frame
i = 1;

%Variabel untuk menyimpan penghitungan perubahan area
perubahanArea = zeros(5,5);

%Variabel untuk menyimpan area
area = zeros(1,5);

%Variabel untuk menyimpan centroid
centroidx = zeros(1,5); centroidy = zeros(1,5);

%Variabel untuk menyimpan boundingbox
bbx1 = zeros(1,5);bbx2 = zeros(1,5);
bby1 = zeros(1,5);bby2 = zeros(1,5);

% Variabel Sementara Sekarang
areaTempNow = zeros(5,1);
centxTempNow = zeros(5,1); centyTempNow = zeros(5,1);
bbx1TempNow = zeros(5,1); bbx2TempNow = zeros(5,1);
bby1TempNow = zeros(5,1); bby2TempNow = zeros(5,1);

% Variabel Sementara Sebelumnya
areaTempOld = zeros(5,1);
centxTempOld = zeros(5,1); centyTempOld = zeros(5,1);
bbx1TempOld = zeros(5,1); bbx2TempOld = zeros(5,1);
bby1TempOld = zeros(5,1); bby2TempOld = zeros(5,1);

% Create a BlobAnalysis object to calculate detected objects' area,
% centroid, major axis length and label matrix.
hBlob = vision.BlobAnalysis('MinimumBlobArea', 5, 'MaximumBlobArea', 50000);
```

```
%% Run The Algorithm in a loop
while ~isDone(vidReader)

    %% Ekstrak Frame
    vidFrame = step(vidReader);

    %% Cropping
    vidFrame = imcrop(vidFrame, [555 0 809 1080]);

    %% Resize
    vidFrame = imresize(vidFrame, 0.592592592592592592592592592592592);

    %% Convert to HSV image
    % convert RGB image to HSV image
    IHSV = rgb2hsv(vidFrame);

    %% Define HSV Color Model Threshold
    % Define thresholds for channel 1 based on histogram settings
    channel1Min = 0.987;
    channel1Max = 0.176;

    % Define thresholds for channel 2 based on histogram settings
    channel2Min = 0.312;
    channel2Max = 1.000;

    % Define thresholds for channel 3 based on histogram settings
    channel3Min = 0.202;
    channel3Max = 1.000;

    %% Create Mask from Threshold

    Ibw = ( (IHSV(:,:,1) >= channel1Min) | (IHSV(:,:,1) <= channel1Max) ) & ...
        (IHSV(:,:,2) >= channel2Min ) & (IHSV(:,:,2) <= channel2Max) & ...
        (IHSV(:,:,3) >= channel3Min ) & (IHSV(:,:,3) <= channel3Max);

    %% Morfologi
    % Opening
    Ihsv = bwareaopen(Ibw,50);

    % Pencarian Batas Kontur
    [~,threshold] = edge(Ihsv, 'sobel');
    fudgeFactor = 0.5;

    BWs = edge(Ihsv, 'sobel', threshold*fudgeFactor);
```

```
% Dilasi
BWsdil = imdilate(BWs, [se90 se0]);

% Filling
BWdfill = imfill(BWsdil, 'holes');

% Lubang dari Irisan Dilasi dan NotFilling
BWholes = BWdfill & ~BWsdil;

% Opening Big Holes
bigHoles = bwareaopen(BWholes, 1000);

% Irisan untuk Small Holes
smallHoles = BWholes & ~bigHoles;

% Hasil yang telah digabung dari proses dilasi dan small Holes
BWfillSmall = BWsdil | smallHoles;

% Closing
BWclose = imclose(BWfillSmall, strel('disk', 2));

% Erosi
BWfinal = imerode(BWclose, seD);

% Opening
Ibwopen = bwareaopen(BWfinal, 200);

%% Blob Labeling
% Extract the blobs from the frame
[areaOut, centroidOut, bboxOut] = step(hBlob,Ibwopen);
sizeCent = length(areaOut);

if sizeCent < 1
    area(1,i)=0;
    centroidx(1,i) = 0;
    centroidy(1,i) = 0;
    bbx1(1,i) = 0; bbx2(1,i) = 0; bby1(1,i) = 0; bby2(1,i) = 0;
    detected(1,i) = false;
    m = m+1;
else
    m = m+1;
    for j = 1 : sizeCent
        %Mencatat Area
        area(j,i) = areaOut(j);
        % Mencatat Centroid
```

```
            centroidx(j,i) = round(centroidOut(j,1));
            centroidy(j,i) = round(centroidOut(j,2));

            %catat bbox nya
            bbx1(j,i) = bboxOut(j,1);
            bbx2(j,i) = bboxOut(j,1) + bboxOut(j,3);
            bby1(j,i) = bboxOut(j,2);
            bby2(j,i) = bboxOut(j,2) + bboxOut(j,4);
            %catat detected
            detected(j,i) = false;
        end
    end
    %Perbaharui nilai SizeCent
    sizeCent = length(area(:,i));

    %Mengecek apakah frame sudah bukan frame pertama untuk penentuan nilai
    %awal detected tiap frame
    if i>1
        %Menambahkan value detected dengan nilai yang sama pada frame
        %sebelumnya
        detected(:,i) = detected(:,i-1);
    end

    for j = 1 : sizeCent
        % Menyimpan Area ke variable now sementara untuk di tukarkan
        % nantinya
        areaTempNow(j) = area(j,i);
        % Menyimpan Centroid ke variable now sementara untuk di tukarkan
        % nantinya
        centxTempNow(j) = centroidx(j,i);
        centyTempNow(j) = centroidy(j,i);
        % Menyimpan bbox ke variable now sementara untuk di tukarkan
        % nantinya
        bbx1TempNow(j) = bbx1(j,i);
        bbx2TempNow(j) = bbx2(j,i);
        bby1TempNow(j) = bby1(j,i);
        bby2TempNow(j) = bby2(j,i);

        % Menyimpan nilai ke variabel old sementara
        % Jika nilai sebelumnya bernilai bukan 0
        a = [1,i-20];
        a = a((i/20>1)+1);
```

```
        if i == 1
            % Menyimpan Area = 0 ke variable old sementara untuk di tukarkan
            % nantinya
            areaTempOld(j) = 0;
            % Menyimpan Centroid = 0 ke variable old sementara untuk
            % di tukarkan nantinya
            centxTempOld(j) = 0;
            centyTempOld(j) = 0;
            % Menyimpan bbox = 0 ke variable old sementara untuk di tukarkan
            % nantinya
            bbx1TempOld(j) = 0;
            bbx2TempOld(j) = 0;
            bby1TempOld(j) = 0;
            bby2TempOld(j) = 0;
        elseif area(j,i-1) ~= 0
            % Menyimpan Area ke variable old sementara untuk di tukarkan
            % nantinya
            areaTempOld(j) = area(j,i-1);
            % Menyimpan Centroid ke variable old sementara untuk di tukarkan
            % nantinya
            centxTempOld(j) = centroidx(j,i-1);
            centyTempOld(j) = centroidy(j,i-1);
            % Menyimpan bbox ke variable old sementara untuk di tukarkan
            % nantinya
            bbx1TempOld(j) = bbx1(j,i-1);
            bbx2TempOld(j) = bbx2(j,i-1);
            bby1TempOld(j) = bby1(j,i-1);
            bby2TempOld(j) = bby2(j,i-1);
        else
            %Jika nilai sebelumnya adalah 0, maka dicari nilai
            %terakhir yang bukan 0 dengan batasan 20 indeks
            %sebelumnya

            % Menyimpan Area ke variable old sementara untuk di tukarkan
            % nantinya
            temp = area(j,a:i-1);
            temp = temp(temp~=0);
            if isempty(temp)
                temp(1) = 0;
            end
            areaTempOld(j) = temp(end);

            % Menyimpan Centroid ke variable old sementara untuk di tukarkan
            % nantinya
            temp = centroidx(j,a:i-1);
```

```
            temp = temp(temp~=0);
            if isempty(temp)
                temp(1) = 0;
            end
            centxTempOld(j) = temp(end);

            temp = centroidy(j,a:i-1);
            temp = temp(temp~=0);
            if isempty(temp)
                temp(1) = 0;
            end
            centyTempOld(j) = temp(end);

            % Menyimpan bbox ke variable old sementara untuk di tukarkan
            % nantinya
            temp = bbx1(j,a:i-1);
            temp = temp(temp~=0);
            if isempty(temp)
                temp(1) = 0;
            end
            bbx1TempOld(j) = temp(end);

            temp = bbx2(j,a:i-1);
            temp = temp(temp~=0);
            if isempty(temp)
                temp(1) = 0;
            end
            bbx2TempOld(j) = temp(end);

            temp = bby1(j,a:i-1);
            temp = temp(temp~=0);
            if isempty(temp)
                temp(1) = 0;
            end
            bby1TempOld(j) = temp(end);

            temp = bby2(j,a:i-1);
            temp = temp(temp~=0);
            if isempty(temp)
                temp(1) = 0;
            end
            bby2TempOld(j) = temp(end);
        end
    end
```

```
%Pertukaran Blob
statusPertukaran = false;

for k = 1 : sizeCent
    selisih = [100000 100000]; index = 0;
    % Mencari blob terdekat antara frame sekarang dan sebelumnya
    for j = 1 : sizeCent
        if (centxTempOld(k) - centxTempNow(j))^2 + ...
                (centyTempOld(k) - centyTempNow(j))^2 < ...
                selisih(1)^2 + selisih(2)^2 && ...
                centxTempNow(j)~=0 && centyTempNow(j)~=0 ...
                && (centxTempNow(j) > bbx1TempOld(k) && ...
                centxTempNow(j) < bbx2TempOld(k)) && ...
                (centyTempNow(j) > bby1TempOld(k) ...
                && centyTempNow(j) < bby2TempOld(k))
            selisih = [abs(centxTempOld(k)-centxTempNow(j)) ...
                abs(centyTempOld(k)-centyTempNow(j))];
            index = j;
            statusPertukaran = true;
        end
    end
    % Menukar blob terdekat yang indexnya tidak sama
    if index ~= 0
        % Memasukkan nilai variabel sementara ke array
        area(k,i) = areaTempNow(index);
        centroidx(k,i) = centxTempNow(index);
        centroidy(k,i) = centyTempNow(index);
        bbx1(k,i) =  bbx1TempNow(index);
        bbx2(k,i) =  bbx2TempNow(index);
        bby1(k,i) =  bby1TempNow(index);
        bby2(k,i) =  bby2TempNow(index);
        % Menghapus nilai yang sudah dimasukkan ke array
        areaTempNow(index) = [];
        centxTempNow(index) = [];
        centyTempNow(index) = [];
        bbx1TempNow(index) = [];
        bbx2TempNow(index) = [];
        bby1TempNow(index) = [];
        bby2TempNow(index) = [];
        % Karena ukuran variabel berkurang maka ditambahkan nilai 0 di
        % akhir variabel
        areaTempNow(length(areaTempNow)+1) = 0;
        centxTempNow(length(centxTempNow)+1) = 0;
        centyTempNow(length(centyTempNow)+1) = 0;
        bbx1TempNow(length(bbx1TempNow)+1) = 0;
```

```
            bbx2TempNow(length(bbx2TempNow)+1) = 0;
            bby1TempNow(length(bby1TempNow)+1) = 0;
            bby2TempNow(length(bby2TempNow)+1) = 0;
        elseif areaTempOld(k)~=0
            % Menetapkan nilai false pada detected karena blob hilang
            %detected(k,i) = false;
            % Memasukkan nilai 0 ke array karena blobnya hilang
            area(k,i) = 0;
            centroidx(k,i) = 0;
            centroidy(k,i) = 0;
            bbx1(k,i) =  0;
            bbx2(k,i) =  0;
            bby1(k,i) =  0;
            bby2(k,i) =  0;
        else
            index = 1;
            % Memasukkan nilai variabel sementara ke array
            area(k,i) = areaTempNow(index);
            centroidx(k,i) = centxTempNow(index);
            centroidy(k,i) = centyTempNow(index);
            bbx1(k,i) =  bbx1TempNow(index);
            bbx2(k,i) =  bbx2TempNow(index);
            bby1(k,i) =  bby1TempNow(index);
            bby2(k,i) =  bby2TempNow(index);
            % Menghapus nilai yang sudah dimasukkan ke array
            areaTempNow(index) = [];
            centxTempNow(index) = [];
            centyTempNow(index) = [];
            bbx1TempNow(index) = [];
            bbx2TempNow(index) = [];
            bby1TempNow(index) = [];
            bby2TempNow(index) = [];
            % Karena ukuran variabel berkurang maka ditambahkan nilai 0 di
            % akhir variabel
            areaTempNow(length(areaTempNow)+1) = 0;
            centxTempNow(length(centxTempNow)+1) = 0;
            centyTempNow(length(centyTempNow)+1) = 0;
            bbx1TempNow(length(bbx1TempNow)+1) = 0;
            bbx2TempNow(length(bbx2TempNow)+1) = 0;
            bby1TempNow(length(bby1TempNow)+1) = 0;
            bby2TempNow(length(bby2TempNow)+1) = 0;
        end
    end
```

```
    if statusPertukaran == true
        % Menghapus nilai 0 pada variable sementara
        areaTempNow = areaTempNow(areaTempNow~=0);
        centxTempNow = centxTempNow(centxTempNow~= 0);
        centyTempNow = centyTempNow(centyTempNow~= 0);
        bbx1TempNow = bbx1TempNow(bbx1TempNow~= 0);
        bbx2TempNow = bbx2TempNow(bbx2TempNow~= 0);
        bby1TempNow = bby1TempNow(bby1TempNow~= 0);
        bby2TempNow = bby2TempNow(bby2TempNow~= 0);

        % Buat Blob baru pada array jika ada nilai selain 0
        % yang tersisa di variable sementara
        for j = 1 : length(areaTempNow)
            area(sizeCent+j,i) = areaTempNow(j);
            centroidx(sizeCent+j,i) = centxTempNow(j);
            centroidy(sizeCent+j,i) = centyTempNow(j);
            bbx1(sizeCent+j,i) =  bbx1TempNow(j);
            bbx2(sizeCent+j,i) =  bbx2TempNow(j);
            bby1(sizeCent+j,i) =  bby1TempNow(j);
            bby2(sizeCent+j,i) =  bby2TempNow(j);
            detected(sizeCent+j,i) = false;
        end
    end

    % Mengisi ulang nilai variable sementara agar bisa menyimpan banyak
    % data

    % Variabel Sementara Sekarang
    areaTempNow = zeros(3,1);
    centxTempNow = zeros(3,1); centyTempNow = zeros(3,1);
    bbx1TempNow = zeros(3,1); bbx2TempNow = zeros(3,1);
    bby1TempNow = zeros(3,1); bby2TempNow = zeros(3,1);

    % Variabel Sementara Sebelumnya
    areaTempOld = zeros(3,1);
    centxTempOld = zeros(3,1); centyTempOld = zeros(3,1);
    bbx1TempOld = zeros(3,1); bbx2TempOld = zeros(3,1);
    bby1TempOld = zeros(3,1); bby2TempOld = zeros(3,1);


    %% Deteksi Perubahan Area dan Perpindahan Titik Pusat Blob
    %deteksi tiap 20 frame
    if mod(m,20) == 0 && m~=0 && i>=20
        %reset nilai range tiap 10 frame
        rangeMax = 0;rangeMin = 10000000;
```

```
        %membuat variabel index untuk menyimpan index mana saja yang akan
        %diproses
        index = (1:sizeCent);
        %looping untuk mengecek blob yang dalam 20 frame memiliki nilai 0
        %lebih dari 10
        for j = 1 : sizeCent
            area20Frame = area(j,i-19:i);
            %jika jumlah nilai 0 lebih besar dari 10, maka indexnya tidak
            %akan diproses
            if length(area20Frame(area20Frame==0)) > 5
                %indeksnya dihapus
                index(j) = 0;
                % Menetapkan nilai false pada detected karena indeks
                % dihapus
                detected(j,i) = false;
            end
        end
        %menghapus nilai 0 pada index
        index = index(index~=0);

        %menghitung perubahan area, dan pergerekan titik pusat sepanjang 20
        %frame
        for j = index
            %Mengambil nilai dari 20 Frame yang ingin dicek perubahannya
            area20Frame = area(j,i-19:i);
            %Menghapus nilai 0 yang terdapat dalam frame
            area20Frame = area20Frame(area20Frame~=0);
            %Mencatat nilai perubahanArea awal sebagai 0
            perubahanArea(j,i) = 0;
            %Mencatat perubahan nilai ditiap frame dalam 20 frame dalam
            %bentuk persen
            for k = 1:(length(area20Frame)-1)
                perubahanArea(j,i) = perubahanArea(j,i) + ...
                    ((abs(area20Frame(k+1) - area20Frame(k))/ ...
                    area20Frame(k))*100);
            end

            %Mengambil nilai dari 20 Frame yang ingin dicek jarak
            %perpindahan titik pusatnya

            %objek berpindah secara garis lurus, yang dicek jarak titik
            %pusat di frame 1 dan 20
            centroidx20Frame = centroidx(j,i-19:i);
            centroidy20Frame = centroidy(j,i-19:i);
```

```
            %Menghapus nilai 0 yang terdapat dalam frame
            centroidx20Frame = centroidx20Frame(centroidx20Frame~=0);
            centroidy20Frame = centroidy20Frame(centroidy20Frame~=0);
            % Mencatat jarak perpindahan titik pusat
            movCentroid = sqrt(abs((centroidx20Frame(...
                length(centroidx20Frame))-centroidx20Frame(1))*...
                (centroidx20Frame(length(centroidx20Frame))- ...
                centroidx20Frame(1))+(centroidy20Frame( ...
                length(centroidy20Frame))-centroidy20Frame(1))* ...
                (centroidy20Frame(length(centroidy20Frame))- ...
                centroidy20Frame(1))));
            movingCentroid(j,i) = movCentroid;

            % Mengecek apakah nilai perubahan area melebihi threshold dan
            % perpindahan titik pusat tidak melebihi threshold
            if perubahanArea(j,i)>50 && movingCentroid(j,i)<=40
                % Menetapkan nilai true pada detected
                detected(j,i) = true;
            else
                % Menetapkan nilai false pada detected
                detected(j,i) = false;
            end
        end
    end
    %% Memberikan Bounding Box
    % mengisi variabel bboxOut dengan nilai 0
    bbOut = zeros(3,4);

    % Melakukan pengulangan blob
    for j = 1:sizeCent
        % Melakukan pengecekan detected
        if detected(j,i)
            % Karena detected, maka bounding box dimunculkan
            bbOut(j,:) = [bbx1(j,i) bby1(j,i) bbx2(j,i)-bbx1(j,i) ...
                bby2(j,i)-bby1(j,i)];
        else
            % Karena tidak detected, maka bounding box tidak dimunculkan
            bbOut(j,:) = [0 0 0 0];
        end
    end
```

```
%% Menghitung Jarak

%inisialisasi data skala jarak
dataSkalaJarak = [223 233 244 256 270 286 305 ...
    328 356 391 436 498 587 734 1028; ...
    8 7.5 7 6.5 6 5.5 5 4.5 4 3.5 3 2.5 2 1.5 1];

%mencari objek terdekat
closestObject = 0;
for x = 1 : size(bbOut,1)
    if round(bbOut(x,2))+bbOut(x,4) >= closestObject
        closestObject = double(round(bbOut(x,2))+bbOut(x,4));
    end
end

%Mencari pixel skala diantara objek
pixBetweenObject = 0;
selisihClosestDanSkala = 1000;
pembanding = 0;
for x = 1 : size(dataSkalaJarak, 2)
    if abs(closestObject - dataSkalaJarak(1,x)) < selisihClosestDanSkala
        selisihClosestDanSkala = abs(closestObject - ...
            dataSkalaJarak(1,x));
        pembandingPix = dataSkalaJarak(1,x);
        pembandingM = dataSkalaJarak(2,x);
    end
end

%Mencari Jarak dengan PinHole Model
if closestObject == 0
    DISTANCE = 0;
else
    DISTANCE = (pembandingM * pembandingPix )/closestObject;
end

%% Membuat Output

% Membuat objek kotak penanda bounding box
Ishape = insertShape(vidFrame,'rectangle',bbOut,'Linewidth',4, ...
    'Color','green');

% Membuat Tulisan Jarak
Itext = insertText(Ishape,[20 20],[num2str(DISTANCE, '%0.2f') ' m'], ...
    'FontSize',30,'BoxColor',[255 255 0]);
```

```
    % Munculkan di Video Player
    step(vidPlayer, Itext);

    %% Menyimpan File Frame
    %{
    namaFile = sprintf('%s_%i',baseFileNameNoExtenstion,i);
    outputBaseName = [namaFile,'.JPG'];
    fullDestination = fullfile(destinationFolder, ...
        "\",baseFileNameNoExtenstion);
    fullDestinationFileName = fullfile(fullDestination,outputBaseName);
    if ~exist(fullDestination,'dir')
        mkdir(fullDestination);
    end
    imwrite(Itext,fullDestinationFileName);
    %}

    %% Menambah Index Frame
    i = i+1;
end

%% Cleanup
release(vidReader)
release(hBlob)
release(vidPlayer)
```