

The title of this paper is taken from a workshop organized by the Cambridge Digital Humanities Network, convened by Anne Alexander, Alan Blackwell, Geoff Cox and Leo Impett, and held at Darwin College, University of Cambridge, 11 July 2016, <http://www.digitalhumanities.cam.ac.uk/Methods/waysofmachineseeing> (Proximus NV → RIPE Network Coordination Centre → Jisc Services Limited) This essay is also available as part of the Unthinking Photography project, commissioned by The Photographers Gallery, London. See <https://www.unthinking-photography/themes/machine-vision/ways-of-machine-seeing>

[2] Ways of Seeing, Episode 1 (1972), https://www.youtube.com/watch?v=opDE4VX_9kK (https://www.youtube.com/watch?v=opDE4VX_9kK) (Proximus NV → RIPE Network Coordination Centre → Jisc Services Limited) This essay is also available as part of the Unthinking Photography project, commissioned by The Photographers Gallery, London. See <https://www.unthinking-photography/themes/machine-vision/ways-of-machine-seeing>

[3] 1972 BBC four-part television series of 30-minute films was created by writer John Berger and producer Mike Dibb. Berger's scripts were adapted into a book of the same name, published by Penguin also in 1972. The book consists of seven numbered essays: four using words and images; and three essays using only images. See <https://en.wikipedia.org/wiki/WaysOfSeeing>. (Proximus NV → RIPE Network Coordination Centre → Telia Company AB → Wikimedia Foundation, Inc.)

[4] René Magritte, The Key of Dreams (1930), <https://courses.washington.edu/hypertext/cgi-bin/book/visualimages/keydreams.jpg>. (Proximus NV → Level 3 Communications, Inc. → University of Washington → University of Washington) Aside from the work of Magritte, Joseph Kosuth's One and Three Chairs (1965) comes to mind, that makes a similar point in presenting a chair, a photograph of the chair, and an enlarged dictionary definition of the word "chair", https://en.wikipedia.org/wiki/One_and_Three_Chairs (https://en.wikipedia.org/wiki/One_and_Three_Chairs). (Proximus NV → RIPE Network Coordination Centre → Telia Company AB → Wikimedia Foundation, Inc.)

[5] The first section of the programme/book is acknowledged to be largely based on Benjamin's essay "The Work of Art in the Age of Mechanical Reproduction" (1936), <https://www.marxists.org/reference/subject/philosophy/works/ge/benjamin.htm>. (Proximus NV → TATA COMMUNICATIONS (AMERICA) INC → Hetzner Online GmbH)

[6] The idea is that "separation" produces a disunity that is disturbing to the viewer/reader – Brecht's "alienation-effect" (Verfremdungseffekt) – and that this leads to a potential "return from alienation". See https://en.wikipedia.org/wiki/Distancing_effect (https://en.wikipedia.org/wiki/Distancing_effect). (Proximus NV → RIPE Network Coordination Centre → Telia Company AB → Wikimedia Foundation, Inc.)

[7] To give a sense of scale and its consequences, Facebook has developed the face-recognition software DeepFace. With over 1.5 billion users that have uploaded more than 250 billion photographs, it is allegedly capable of identifying any person depicted in a given image with 97% accuracy. See <https://research.facebook.com/publications/deepface-closing-the-gap-to-human-level-performance-in-face-verification/>. (Proximus NV → Facebook, Inc.)

[8] Antoine Allen "The 'three black teenagers' search shows it is society, not Google, that is racist", The Guardian (10 June 2016), <https://www.theguardian.com/commentisfree/2016/jun/10/three-black-teenagers-google-racist-tweet>. (Proximus NV → RIPE Network Coordination Centre → Telia Company AB → Fastly)

[9] Adrian Mackenzie, "The Production of Prediction: What Does Machine Learning Want?" European Journal of Cultural Studies 18, 4–5 (2015): 431.

[10] Mackenzie, "The Production of Prediction", 441.

[11] See, for instance, Antoinette Rouvroy's "Technology, Virtuality and Utopia: Governmentality in an Age of Autonomic Computing", in The Philosophy of Law Meets the Philosophy of Technology: Computing and Transformations of Human Agency, eds. Mireille Hildebrandt and Antoinette Rouvroy (London: Routledge, 2011), 136–157.

[12] This line of argument is also close to what Tiziana Terranova has called an "infrastructure of autonomization", making reference to Marx's views on automation, particularly in his "Fragment on Machines", as a description of how machines subsume the knowledge and skill of workers into wider assemblages. Tiziana Terranova, "Red Stack Attack! Algorithms, capital and the automation of the common", Effimera (2014), accessed 5 April 2016, <http://effimera.org/red-stack-attack-algorithms-capital-and-the-automation-of-the-common-di-tiziana-terranova>. (Proximus NV → RIPE Network Coordination Centre → Telia Company AB → NTT America, Inc. → Unified Layer)

[13] Mackenzie, "The Production of Prediction", 441.

[14] I take this assertion from Benjamin once more, who considered the question of whether film or photography to be art secondary to the question of how art itself has been radically transformed: "Earlier much futile thought had been devoted to the question of whether photography is an art. The primary question – whether the very invention of photography had not transformed the nature of art – was not raised. Rect.y, letterRect.width, letterRect.height);

Soon the film theoreticians asked the same ill-considered question with regard to film." <https://www.marxists.org/reference/subject/philosophy/works/ge/benjamin.htm>.

[15] Berger was associated with The Writers and Readers Publishing Cooperative, aiming to "advance the needs of cultural literacy, rather than cater to an 'advanced' [academic] but limited readership" (From the Firm's declaration of intent). In this sense it draws upon the Marxist cultural materialism of Raymond Williams and Richard Hoggart's The Uses of Literacy (1966).

```

        putText(wim,word,Point(x1,y1),fontface,0.5,CV_RGB(255,0,0), 1, 8);
        confidence_level+=conf;
        j++;
    }
    //}
    delete[] word;
} while (ri->Next(level));
}

}
// printf("OCR output:\n%s", outText);
// printf("num lines: %d \n",numlines);
// printf("num symbols: %d \n",j);
// printf("confidence level: %d \n",confidence_level);
if(numlines>40){
    printf("%d\n",confidence_level/j);
    imwrite(argv[2],wim);
}else{
    printf("%d\n",0);
    imwrite(argv[2],wim);
}
// namedWindow( "Detected Lines", 1 );
// imshow( "Detected Lines", color_dst );
// imshow( "Result", in);
// imshow( "Wim", win);
// imwrite("words.jpg",wim);

// waitKey();
// Destroy used object and release memory
api->End();
// delete [] outText;
pixDestroy(&image);

return 0;
}

```