

REVIEW OF THE SOFTWARE FOR PROCESSING AND ANALYZING CAMERA TRAP DATA: NEURAL NETWORKS AND WEB SERVICES

S.S. Ogurtsov¹, V.A. Efremov², A.V. Leus³

¹ Central Forest State Nature Biosphere Reserve, Zapovedny village, Tver region, Russia

¹ A. N. Severtsov Institute of Ecology and Evolution of RAS, Moscow, Russia

^{2,3} Moscow Institute of Physics and Technology (National Research University), Dolgoprudny, Moscow Region, Russia

¹ etundra@mail.ru, ² efremov.va@phystech.edu, ³ leus.av@mipt.ru

Abstract. Camera trap data processing is still one of the most significant problems in research with these devices worldwide. This review considers modern software for such processing using convolutional neural network technologies, which simplify this process many times over. A total of 5 software applications are parsed. Three of them are web-services (Wildlife Insights, Agouti, WildTrax), and two are desktop applications (Timelapse, Camelot). All software applications are open access, free to use, efficient in operation, easy to learn, and do not require programming skills. All of them have been tested within the framework of the Central Forest Nature Reserve Camtrap Monitoring Program. As a result, their key features, advantages and disadvantages are identified. Tagging speed and accuracy of automatic classification were measured for each software application. *Results.* All three web services proved to be very user-friendly and efficient. Wildlife Insights had the most accurate classification (Accuracy = 87%). However, Agouti had the fastest tagging speed among the web services (1.22 frames/sec). The absolute leader in tagging speed was Timelapse (1.32 frames/sec). Among all currently available desktop applications for camera trap data processing, we consider Timelapse to be the best, which we strongly recommend to all biologists and ecologists conducting research with camera traps.

Keywords: artificial intelligence, camera traps, convolutional neural networks, data processing, monitoring, software, web services

For citation: Ogurtsov S.S., Efremov V.A., Leus A.V. Review of the software for processing and analyzing camera trap data: neural networks and web services. Russian Journal of Ecosystem Ecology. 2024;9(1). (In Russ.). Available from: <https://doi.org/10.21685/2500-0578-2024-1-2>