[3] 赵顺利,史延标,韩书娟,等. 全钢巨型工程机械子午线轮胎X射线检验质量缺陷的原因分析[J]. 轮胎工业,2012,32(4):250-251.

[4] Abdel-Hamid O,Mohamed A R,Jiang H,et al. Convolutional Neural Networks for Speech Recognition[J]. IEEE/ACM Transactions on Audio Speech & Language Processing,2014,22(10):1533-1545.

[5] Gerhard Schall,Tobias Langlotz. Mobile Augmented Reality:Robust Detection and Tracking of Annotations for Out Door Augmented Reality Browsing[J]. Computers & Graphics,2011,35(4):831-840.

[6] Alex K,Ilya S,Geofrey H. Image Net Classification with Deep Convolutiona1 Neural Networks[J]. Advances in Neural Information Processing Systems,2012,25(2):1106-1114.

[7] 岳耀平. 全钢载重子午线轮胎胎体帘线变形原因分析及解决措施[J]. 轮胎工业,2012,32(1):52-53.

[8] Hong R,Meng W,Yue G,et a1. Image Annotation by Multiple Instance Learning With Discrim Inative Feature Mapping and Selection[J]. Cybernetics IEEE Transactionson,2014,44(5):669-680.

Defect Detection of Tire by X Ray Image Based on Convolutional Neural Network

BIAN Guolong,LI Yong,QI Shunqing,WANG Yanju,YU Shenghong,SONG Meiqin
(Qingdao DoubleStar Tire Industry Co.,Ltd,Qingdao　266400,China)

Abstract:In order to solve the problem that it was difficult to obtain the accurate image features by using the common X ray image method for tire defect detection, a method of obtaining image features through convolutional neural network was proposed. In this method,the X ray image of tire was enhanced, and then the network model was established. The training algorithm was used to obtain the image defect features,and the trained model was used to identify the defects in the image. First,the neurons corresponding to the parameters were divided into critical and non-critical parts. Then,the local critical points and dynamic learning rate were used to achieve quick adjustment of parameters. The experiment results showed that the designed network model was less susceptible to get over fitted, and it had a faster parameter adjustment, a shorter time and higher accuracy of defect detection.

Key words:tire;image segmentation;deep learning;convolutional neural network;defect detection

需求强劲拉动欧洲轮胎销量

欧洲轮胎和橡胶制造商协会(ETRMA)最新数据显示,2018年第4季度欧洲替换轮胎的需求强劲,助推2018年全年轿车和载重轮胎整体出货量超越2017年的水平。

ETRMA数据显示,与此形成鲜明的对照,原配轮胎和替换农业及两轮车轮胎出货量则低于2017年的水平。2018年第4季度消费者替换轮胎出货量增加2.8%至4 850万条,轿车和载重轮胎替换轮出货量增加1.2%至2.075亿条。冬季轮胎出货量大于夏季,增幅为1.4%,夏季轮胎出货量则下滑了0.3%。

2018年第4季度,替换卡车/大客车轮胎需求量跃升16%至278万条,推动2018年出货量增长8.8%至1 060万条。另一方面,原配轮胎出货量下降3.6%至8 370万条,而原配载重轮胎出货量则上升4.3%,达635万条。全年替换农业轮胎出货量为124万条,增幅为3.5%,虽然该季度农业轮胎出货量增长了10%。替换摩托车轮胎出货量尽管在2018年第4季度增长了8.4%,但全年却下降了1.8%至897万条。

ETRMA秘书长Fazilet Cinaralp说:"2018年的数据证实,稳定的市场正在按预期的趋势发展,冬季轮胎和全天候轮胎持续增长促进了道路安全。此外,协会成员单位在替换载重轮胎市场的销量呈现出良性发展势头,特别是在波兰、德国、西班牙、英国、意大利和荷兰的增长惊人。"

(摘自《中国化工报》,2019-01-31)