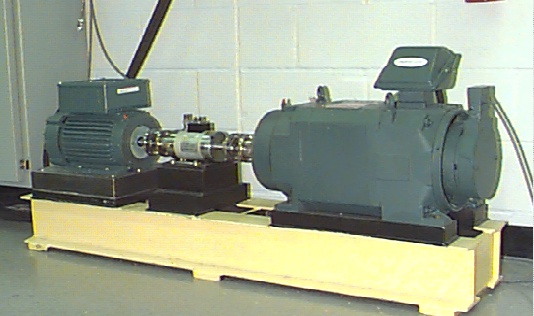
旋转机械故障诊断公开数据集整理

众所周知，当下做机械故障诊断研究最基础的就是数据，再先进的方法也离不开数据的检验。笔者通过文献资料收集到如下几个比较常用的数据集并进行整理。鉴于目前尚未见比较全面的数据集整理介绍。数据来自原始研究方，笔者只整理数据获取途径。如果研究中使用了数据集，请按照版权方要求作出相应说明和引用。在此，公开研究数据的研究者表示感谢和致敬。如涉及侵权，请联系我删除（787452269@qq.com）。欢迎相关领域同仁一起交流。很多优秀的论文都有数据分享，本项目保持更新。星标是比较通用的数据集。个别数据集下载可能比较困难，需要的可以邮件联系我，如版权方有要求，述不提供。

# ☆CWRU（凯斯西储大学轴承数据中心）



数据下载连接（<https://csegroups.case.edu/bearingdatacenter/pages/welcome-case-western-reserve-university-bearing-data-center-website>）

CWRU数据集是使用最为广泛的，文献较多。不一一举例。其中University of New South Wales 的Wade A. Smith在2015年进行了比较全面的总结和对比[1]。比较客观的综述和分析了使用数据进行诊断和分析研究的情况。官方网站提供的是.mat格式的数据，MATLAB直接使用比较方便。

Github上有人分享了在python中自动下载和使用的方法。<https://github.com/Litchiware/cwru>

R语言中使用的方法：<https://github.com/coldfir3/bearing_fault_analysis>

Smith W A, Randall R B. Rolling element bearing diagnostics using the Case Western Reserve University data: A benchmark study[J]. Mechanical Systems and Signal Processing, 2015,64-65:100-131.

# ☆MFPT（机械故障预防技术学会）

NRG Systems总工程师Eric Bechhoefer博士代表MFPT组装和准备数据。

数据链接：（<https://mfpt.org/fault-data-sets/>）

声学和振动数据库链接（<http://data-acoustics.com/measurements/bearing-faults/bearing-2/>）

MATLAB 文档关于MFPT轴承数据的故障诊断举例。

连接（<https://ww2.mathworks.cn/help/predmaint/examples/Rolling-Element-Bearing-Fault-Diagnosis.html>）

使用该数据集的相比于CWRU少一些。2012年更新。

一些对数据描述的论文[2]。

Lee D, Siu V, Cruz R, et al. Convolutional neural net and bearing fault analysis[C]//Proceedings of the International Conference on Data Mining (DMIN). The Steering Committee of The World Congress in Computer Science, Computer Engineering and Applied Computing (WorldComp), 2016: 194.

# ☆德国Paderborn大学

链接：<https://mb.uni-paderborn.de/kat/forschung/datacenter/bearing-datacenter/>

相关说明及论文[3, 4]。

Bin Hasan M. Current based condition monitoring of electromechanical systems. Model-free drive system current monitoring: faults detection and diagnosis through statistical features extraction and support vector machines classification.[D]. University of Bradford, 2013.

Lessmeier C, Kimotho J K, Zimmer D, et al. Condition monitoring of bearing damage in electromechanical drive systems by using motor current signals of electric motors: a benchmark data set for data-driven classification: Proceedings of the European conference of the prognostics and health management society, 2016[C].

# ☆FEMTO-ST轴承数据集

由FEMTO-ST研究所建立的PHM IEEE 2012数据挑战期间使用的数据集[5-7]。

<https://www.femto-st.fr/en>

github链接：<https://github.com/wkzs111/phm-ieee-2012-data-challenge-dataset>

<http://data-acoustics.com/measurements/bearing-faults/bearing-6/>

Porotsky S, Bluvband Z. Remaining useful life estimation for systems with non-trendability behaviour: Prognostics & Health Management, 2012[C].

Nectoux P, Gouriveau R, Medjaher K, et al. PRONOSTIA: An experimental platform for bearings accelerated degradation tests.: IEEE International Conference on Prognostics and Health Management, PHM'12., 2012[C]. IEEE Catalog Number: CPF12PHM-CDR.

E. S, H. O, A. S S V, et al. Estimation of remaining useful life of ball bearings using data driven methodologies: 2012 IEEE Conference on Prognostics and Health Management, 2012[C].2012

18-21 June 2012.

# ☆辛辛那提IMS

<https://ti.arc.nasa.gov/tech/dash/groups/pcoe/prognostic-data-repository/>

相关论文[8, 9]。

Gousseau W, Antoni J, Girardin F, et al. Analysis of the Rolling Element Bearing data set of the Center for Intelligent Maintenance Systems of the University of Cincinnati: CM2016, 2016[C].

Qiu H, Lee J, Lin J, et al. Wavelet filter-based weak signature detection method and its application on rolling element bearing prognostics[J]. Journal of Sound and Vibration, 2006,289(4):1066-1090.

# University of Connecticut

数据链接：<https://figshare.com/articles/Gear_Fault_Data/6127874/1>

数据描述：

Time domain gear fault vibration data (DataForClassification\_TimeDomain)

And Gear fault data after angle-frequency domain synchronous analysis (DataForClassification\_Stage0)

Number of gear fault types=9={'healthy','missing','crack','spall','chip5a','chip4a','chip3a','chip2a','chip1a'}

Number of samples per type=104

Number of total samples=9x104=903

The data are collected in sequence, the first 104 samples are healthy, 105th ~208th samples are missing, and etc.

相关论文[10]。

P. C, S. Z, J. T. Preprocessing-Free Gear Fault Diagnosis Using Small Datasets With Deep Convolutional Neural Network-Based Transfer Learning[J]. IEEE Access, 2018,6:26241-26253.

# XJTU-SY Bearing Datasets（西安交通大学 轴承数据集）

由西安交通大学雷亚国课题组王彪博士整理。

链接：<http://biaowang.tech/xjtu-sy-bearing-datasets/>

使用数据集的论文[11]。

B. W, Y. L, N. L, et al. A Hybrid Prognostics Approach for Estimating Remaining Useful Life of Rolling Element Bearings[J]. IEEE Transactions on Reliability, 2018:1-12.

# 东南大学

github连接：<https://github.com/cathysiyu/Mechanical-datasets>

由东南大学严如强团队博士生邵思雨完成[12]。“Highly Accurate Machine Fault Diagnosis Using Deep Transfer Learning”

Gearbox dataset is from Southeast University, China. These data are collected from Drivetrain Dynamic Simulator. This dataset contains 2 subdatasets, including bearing data and gear data, which are both acquired on Drivetrain Dynamics Simulator (DDS). There are two kinds of working conditions with rotating speed - load configuration set to be 20-0 and 30-2. Within each file, there are 8rows of signals which represent: 1-motor vibration, 2,3,4-vibration of planetary gearbox in three directions: x, y, and z, 5-motor torque, 6,7,8-vibration of parallel gear box in three directions: x, y, and z. Signals of rows 2,3,4 are all effective.

# Acoustics and Vibration Database（振动与声学数据库）

提供一个手机振动故障数据集的公益性网站链接：<http://data-acoustics.com/>

# 机械设备故障诊断数据集及技术资料大全

<https://mekhub.cn/machine-diagnosis>

# **PCoE Datasets**美国宇航局预测数据存储库

链接：<https://ti.arc.nasa.gov/tech/dash/groups/pcoe/prognostic-data-repository/>

[藻类跑道数据集] [CFRP复合材料数据集] [铣削数据集] [轴承数据集] [电池数据集] [涡轮风扇发动机退化模拟数据集] [PHM08挑战数据集] [IGBT加速老化Sata集] [投石机]数据集] [FEMTO轴承数据组] [随机电池使用数据组] [电容器电应力数据组] [MOSFET热过载时效数据组] [电容器电应力数据组 - 2] [HIRF电池数据组]

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[2] Verstraete D, Ferrada A, Droguett E L, et al. Deep learning enabled fault diagnosis using time-frequency image analysis of rolling element bearings[J]. Shock and Vibration, 2017,2017.

[3] Bin Hasan M. Current based condition monitoring of electromechanical systems. Model-free drive system current monitoring: faults detection and diagnosis through statistical features extraction and support vector machines classification.[D]. University of Bradford, 2013.

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[5] Porotsky S, Bluvband Z. Remaining useful life estimation for systems with non-trendability behaviour: Prognostics & Health Management, 2012[C].

[6] Nectoux P, Gouriveau R, Medjaher K, et al. PRONOSTIA: An experimental platform for bearings accelerated degradation tests.: IEEE International Conference on Prognostics and Health Management, PHM'12., 2012[C]. IEEE Catalog Number: CPF12PHM-CDR.

[7] E. S, H. O, A. S S V, et al. Estimation of remaining useful life of ball bearings using data driven methodologies: 2012 IEEE Conference on Prognostics and Health Management, 2012[C].2012

18-21 June 2012.

[8] Gousseau W, Antoni J, Girardin F, et al. Analysis of the Rolling Element Bearing data set of the Center for Intelligent Maintenance Systems of the University of Cincinnati: CM2016, 2016[C].

[9] Qiu H, Lee J, Lin J, et al. Wavelet filter-based weak signature detection method and its application on rolling element bearing prognostics[J]. Journal of Sound and Vibration, 2006,289(4):1066-1090.

[10] P. C, S. Z, J. T. Preprocessing-Free Gear Fault Diagnosis Using Small Datasets With Deep Convolutional Neural Network-Based Transfer Learning[J]. IEEE Access, 2018,6:26241-26253.

[11] B. W, Y. L, N. L, et al. A Hybrid Prognostics Approach for Estimating Remaining Useful Life of Rolling Element Bearings[J]. IEEE Transactions on Reliability, 2018:1-12.

[12] S. S, S. M, R. Y, et al. Highly Accurate Machine Fault Diagnosis Using Deep Transfer Learning[J]. IEEE Transactions on Industrial Informatics, 2019,15(4):2446-2455.