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专注分布式应用和大数据计算领域问题

## 工作经历

2017.01 - 至今 联想研究院, AR 平台, 计算平台架构师.

- 设计开发了基于视频的三维重建离线训练系统。
- 设计开发了基于图像的云端在线识别系统。
- 设计开发了基于用户行为的 AR 资源推荐系统。
- 负责云端大数据计算环境的运维。

2015.10 - 2017.01 阿里巴巴, 平台技术部, 资深研发.

- 设计开发了基于用户行为的特定商品双十一营销项目。
- 开发了会场/详情/购物车/下单链路的营销改造项目。

2011.02 - 2015.10 CSSRC, 平台研发部, 架构师.

- 设计开发了共性基础平台。
- 设计开发 android 平台的三维渲染引擎。
- 设计开发了试验数据管理平台。

2009.01 - 2011.02 CSSRC, 平台研发部, 高级工程师.

- 参与开发并运维了 GIS 管理平台。

2007.01 - 2009.01 CSSRC, 平台研发部, 工程师.

- 参与开发了 GIS 管理平台的地下管线模块。

## 教育背景

2006.09 - 2008.08 硕士学位, 江南大学, 计算应用技术, Oracle-OCP.

2000.09 - 2004.07 学士学位, 南京审计学院, 信息管理与信息系统.

## 项目经历

2017.08 - 至今 基于卷积神经网络的 AR 云端在线识别系统 演示.

- 基于 tensorflow 的 inception-v4 卷积神经网络模型, 对输入图像进行计算, 输出分类维度数据 (利用 endpoint 的原始数据)
- 基于输出的向量, 利用 faiss 构建搜索索引 (索引支持数据的增删改)
- 基于 faiss 输出的索引, 构建分布式搜索服务, 实现在线的识别 (以图搜图)

2017.03 - 2017.07 基于姿态计算的 AR 云端识别系统.

- 构建基于图像的分布式搜索框架 (netty).
- 构建 mysql(binlog)->rocketmq->jstorm->configcenter 实时监听链路, 实现新增模型的实时可搜
- 监听 configcenter 的变化, 将新增或修改模型, 加载到内存, 提供搜索服务。
- 采用一致 hash, 将所有模型离散到所有搜索节点上。
- 实现搜索节点的动态扩容, 缩容。

- 2017.01 - 2017.05 **基于视频的三维重建离线训练系统**, 2017 techword 核心项目.
- 构建分布式离线任务系统集群 (实现任务隔离, 任务 failover 以及 load balance 机制).
  - 对视频数据进行关键帧的抽取, 利用 SIFT 对提取的帧进行特征点抽取.
  - 对抽取的特征进行 match, 并对 match 结果进行校正.
  - 依据相机参数以及 match 的结果, 计算特征点的三维坐标.
  - 依据特征点的三维坐标, match 结果, 训练出三维重建模型.
- 2017.04 - 至今 **基于用户行为的 AR 资源推荐系统**.
- 在前端页面, 设备 sdk 以及后端服务中进行日志埋点 (产生 nginx log).
  - 构建 log->flume->hdfs->hbase->mysql 的离线链路.
  - 构建 log->flume->rocketmq->jstorm->redis 的实时链路.
  - 构建用户行为的 metrics 监控系统.
  - 基于用户行为构建 AR 资源推荐服务
- 2017.01 - 至今 **大数据集群和应用系统的建设与运维**.
- hadoop 集群, hbase 集群, spark 集群, zookeeper 集群, rocketmq 集群的建设与运维.
  - 集群的性能指标监控, 时序数据库 (prometheus). grafana (dashboard) 指标大盘
- 2017.01 - 至今 **AR 分布式业务系统的开发与发布管理**.
- spring cloud 的业务组件日志埋点与发布管理.
  - zuul, feign, eureka, config center, hystrix, sleuth, zipkin 等于组件开发
- 2016.05 - 2016.11 **基于用户行为的特定商品双十一营销项目**, 2016 双十一核心项目.
- 在购物车, 交易成功增加用户行为埋点.
  - 针对特定商品, 特定用户透出特定的优惠资源.
  - 根据商品特征, 以及用户偏好等进行会场坑位个性化排序.
- 2016.01 - 2016.05 **会场/详情/购物车/下单链路的营销改造项目 演示**.
- 基于愚公 (binlog) 实现大卖家库的拆分.
  - 缓存击穿保护, 增加本地热点缓存, 采用 QPS 和 LRU 结合的失效策略.
  - RPC 调用链路梳理, 优化限流保护的阈值.
- 2014.07 - 2015.02 **android 平台的三维渲染引擎 演示**.
- 设计轻量化 CAD 文件格式.
  - 设计并开发了轻量化文件到逻辑模型的转换.
  - 设计并开发了逻辑模型到物理显示模型的转换.
  - 基于 opengl es 开发了 ndk 版本的三维渲染引擎.
  - 利用不同缩放级别显示不同精度, 顶点缓冲, 遮挡模型不显示等技术, 来优化渲染帧率
- 2010.03 - 2012.01 **试验数据管理平台 演示**, 商业化项目, 市场占有率排名第二.
- 负责基于 struts1.2, spring, hibernate, freemake, jbpmm 等组件服务框架搭建.
  - 基于 Eclipse RCP, EMF, GEF 设计开发动态建模, 数据浏览设计, 试验流程设计等工具.
  - 基于 hbase 搭建试验原始数据存储集群.
- 2008.05 - 2010.02 **GIS 管理平台 演示**, 荷兰市政项目.
- 设计并开发了地下管线与开挖区域的计算服务.
  - 设计并开发 3D 地下管线的渲染模块.
  - Oracle spatial 及 geoserver 的运维.

# Longchao Zhu

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*Focus On Middleware, Distributed Application And Big Data Application*

## Work Experience

- 2017.01–now **Lenovo RT**, AR Team, Computing Platform Architect.
- Responsible for offline trained system of 3D reconstruction based on video.
  - Responsible for cloud recognition system based on rgb frame input.
  - Responsible for AR resource recommendation system based on user behavior logs.
  - Responsible for maintenance of big data and computing components cluster.
  - Responsible for Deployment and Log injection of AR cloud platform based on Spring Cloud
- 2015.10–2017.01 **Alibaba**, Platform Technical Department, Senior Engineer.
- Responsible for the specified item recommendation project to specified user in 1111.
  - Develop the project of sima/detail/cart/buy system optimization.
- 2011.02–2015.10 **CSSRC**, Platform Research Department, Architect.
- Responsible for the software product development of IBMS.
  - Responsible for 3D Rendering Engine to show CAD file in android platform.
  - Responsible for the software product development of TDM.
- 2009.01–2011.02 **CSSRC**, Platform Research Department, Senior Engineer.
- Develop and maintain the GIS platform(XEIZ)
- 2007.01–2009.01 **CSSRC**, Engineer.
- Develop the underground pipeline management system of GIS platform(XEIZ).

## Education

- 2003.09–2006.03 **Master**, Jiangnan University, Computer Application Technology, Oracle-OCP.
- 1999.09–2003.07 **Bachelor**, Nanjing Audit University, Information Management And Information System.

## Project Experience

- 2017.08–Now **Cloud Recognizaiton Platform based on CNN and Bow**, Leader, [Demo](#).
- Develop the computing flow of encode image to vector using inception-v4 cnn model in tensorflow framework.
  - Develop the image index server using faiss library, which is privde rpc service using grpc.
  - Develop the distributed search server to call image index server.
- 2017.03–2017.07 **Cloud Recognition Platform based on post computation** , Leader.
- Develop the distributed image search framework using netty.
  - Develop the model realtime processing platform, mysql(binlog)->rocketmq->jstorm->configcenter.
  - Listenr on datanode of config center,refresh model(3D sparse model) in to memory which datanode is changed
  - Let all model can be loaded in different searching node fairly, we use consistently hash algorithm.
  - The search nodes can be added or removed automatically.

- 2017.01–2017.05 **Offline trained System of 3D reconstruction based on video**, 2017 techworld core project, Architect.
- Develop the distributed offline job platform(job is isolated, computing node is load balance, job can be transferred to other node when the current node is down).
  - Capture the key frame from video, Extract the feature point using sift.
  - Match the feature point of different frame, refine the match result using RANSAC.
  - Computing the 3D location of feature point using camera parameter and match result.
  - Train the sparse model using 3D point and match result.
- 2017.04–Now **AR resource recommendation system**, Leader.
- Develop the log collection sdk of javascript version and java version, each is for web page and android application, log is record in nginx.
  - Develop the log offline analysis system(log->flume->hdfs->hbase->mysql)
  - Develop the log realtime analysis system(log->flume->rocketmq->jstorm->redis)
  - Develop the AR resource metrics monitor system.
  - Develop the AR recommendation system based on user access log.
- 2017.01 - Now **Development and Maintenance of Big Data Cluster and Application**, Leader.
- Development and Maintenance of hadoop cluster, hbase cluster, spark cluster, zookeeper cluster, rocketmq cluster, jstorm cluster, etc.
  - Metrics monitor of cluster, collect metrics in time sequence database(prometheus), show the metrics dashboard in grafana
- 2017.01 - Now **Development and Deployment of Distributed AR Application**.
- Log injection in spring cloud business components, Deploy spring cloud business components.
  - Develop spring cloud components of zuul, feign, eureka, config center, hystrix, sleuth, zipkin.
- 2016.05–2016.11 **Specified product recommendation system for specified user**, Alibaba 1111 core Project, Tech Leader.
- Add the log record in cart and buy system.
  - Deliver the specified promotion for specified item for specified user in specified time.
  - The item order in sima system is decided by item feature and user preference
- 2016.01–2016.05 **Sima/detail/cart/buy system optimization project**, Member, [Demo](#).
- Split the big seller database using yugong (binlog).
  - Add local cache for some hot item to protect the cache server, the invalidation rule of local cache is QPS+LRU.
  - Reduce the rpc calling count to optimize the qps threshold of rpc service
- 2014.07–2015.02 **3D rendering engine in android platform**, leader, [Demo](#).
- Design the light format of cad file.
  - Develop the parsing module of light format file to logical model
  - Develop the module of converting the logical model to physical showing model.
  - Develop the 3d rendering view using opengles in android
  - Optimize the showing frame performance per second using vertex buffer etc.
- 2010.03–2012.01 **Testing Data Management System**, Architect, [Demo](#).
- Develop the framework using struts1.2, spring, hibernate, freemake, jbpmm, etc components.
  - Develop the designing db model tool using eclipse emf, data navigation tool using eclipse gef and workflow tool using eclipse gef.
  - Develop the original testing data management cluster using hbase.
- 2008.05–2010.02 **GIS Platform** [Demo](#).
- Develop the service to computing digging area and underground pipeline whether they are cross.
  - Develop the 3D rendering tool to show underground pipeline
  - Maintain the Oracle spatial database and GeoServer service.