



AI
人工智能



Blockchain
区块链



Cloud
云技术



Ping An AI

F7MAX

平安云

Ping An Core Technologies 1: Ping An AI *and Deep-dives in Financial Services and Healthcare AI*

平安核心科技（一）：平安人工智能
及平安金融服务和医疗科技案例

Ping An Investor Day



Jing Xiao

肖京

Chief Scientist of Ping An Group

平安集团首席科学家

Ping An Investor Day

Ping An Has An AI Team Of 1000+ Top Experts

平安AI汇聚1,000+顶级专家



Head of AI Financial Application Field

平安科技智能金融应用领域负责人 (北美)

Ohio State University
俄亥俄州立大学博士
Expert in Fintech Big Data

金融大数据分析专家



Head of Pattern Recognition Field

平安科技模式识别领域负责人

PhD of Tsinghua University
清华大学博士
Expert in CV and PR
计算机视觉和模式识别专家

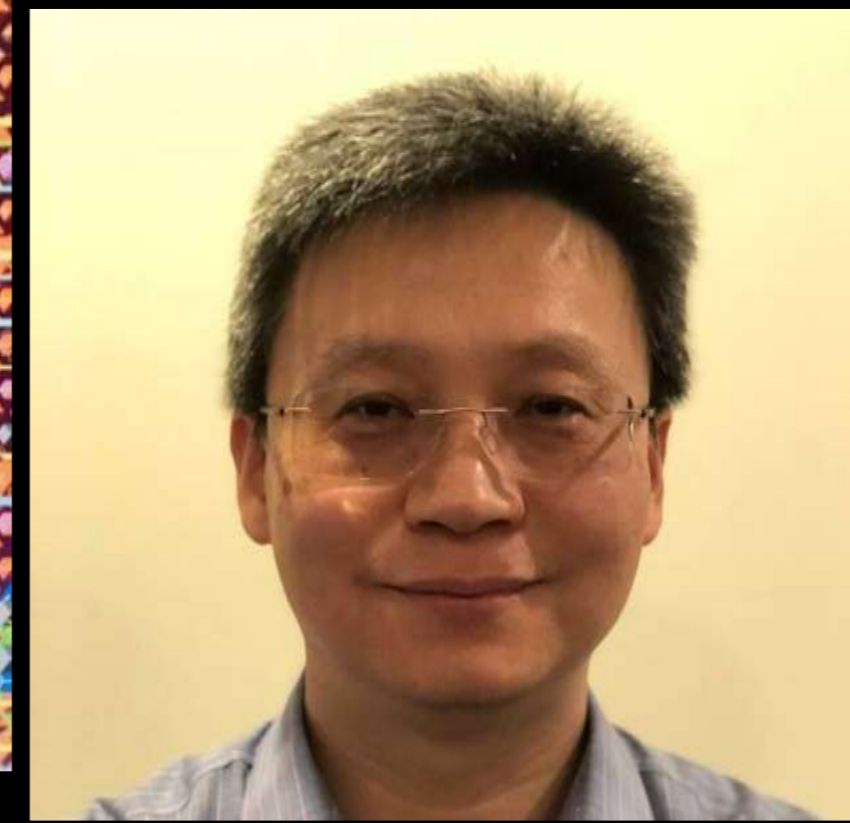


Head of Automatic Speech Recognition and NLP Field

平安科技智能语音识别与自然语音处理领域负责人

Postdoc of University of Florida

美国佛罗里达大学博士后
Expert in Deep Learning
深度学习专家



Lab Head of PAT, US Research Lab (Washington)

平安科技美国研究院 (华盛顿) 执行院长

PhD of JHU
约翰霍普金斯大学博士

Expert in Medical Imaging
医疗影像专家



Lab Head of PAT, China Research Lab

平安科技中国研究院院长
PhD of University of Illinois

伊利诺伊大学博士

Expert in NLP
自然语言处理专家



Chief Scientist of Ping An Group

平安集团首席科学家
PhD of Carnegie Mellon University

卡耐基梅隆大学博士

World's top algorithm scientist
世界顶级算法科学家



Lab Head of PAT, US Research Lab (Silicon Valley)

平安科技美国研究院 (硅谷) 执行院长

PhD of Tsinghua University
清华大学博士

Expert in CV
计算机视觉专家

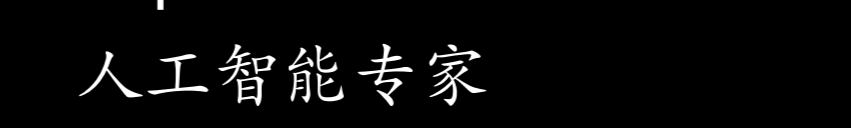


Head of Intelligent Prediction and Operation Optimization Field

平安科技智能预测与运营优化领域负责人

PhD of University of Oxford

牛津大学博士
Expert in AI
人工智能专家

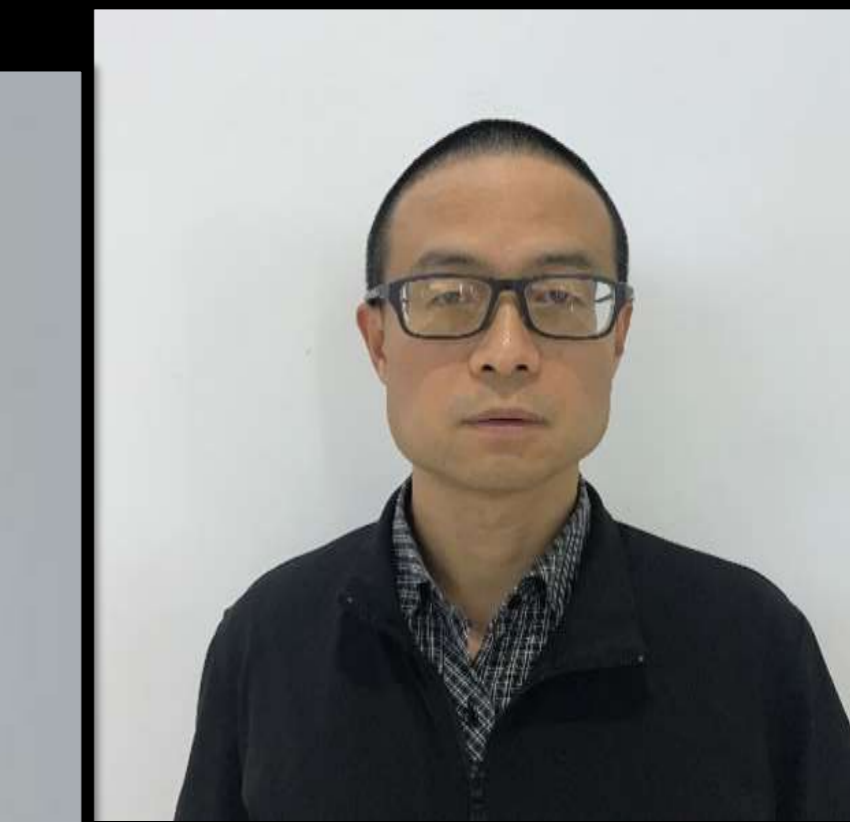


Head of AI Medical Application Field

平安科技智能医疗应用领域负责人

PhD of Columbia University
哥伦比亚大学博士

Expert in Medical Big Data
医疗大数据专家



Head of AI Algorithm Research Field

平安科技智能算法领域负责人

PhD of Peking University
北京大学博士

Expert in Big Data & AI
大数据与人工智能专家



Head of Image Recognition Field

平安科技图像识别领域负责人 (北美)

PhD of National Taiwan University
台湾大学博士

Expert in CV
计算机视觉专家



The Development Of AI Includes Three Stages

人工智能发展历程经过三个阶段

Newborn Stage

婴儿阶段

Developing recognition ability
形成基础感知能力



To See: Face Recognition, Micro-expression Recognition, etc.

看: 人脸识别、微表情识别等



To Hear: Voiceprint Recognition, ASR, etc.

听: 声纹识别、语音识别等



To Speak/To Read: TTS, Text Robot, etc.

说/读: 语音合成、对话理解等

Learning Stage

学习阶段

Developing knowledge graph
构建全面知识体系



Massive Data

海量信息



Text
文本



Image
图像

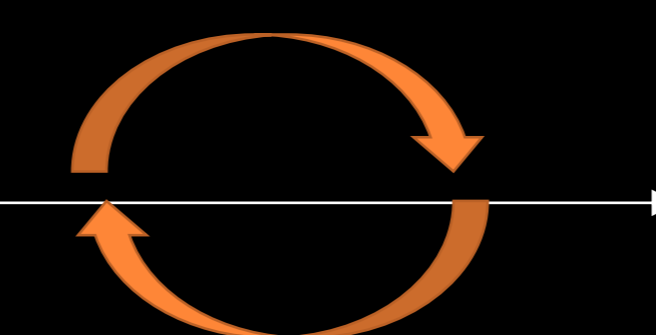


Speech
语音



Video
视频

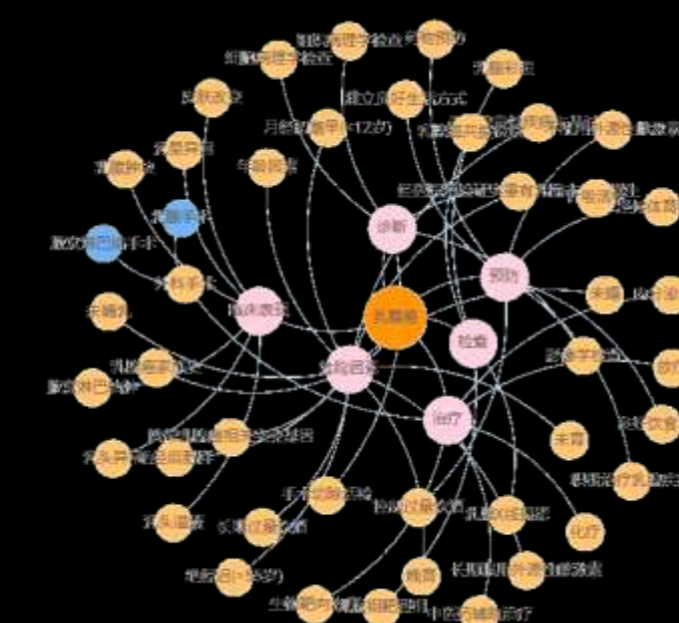
Learn/Think
学习/思考



Interact / Decide
交互/决策

Knowledge Graph

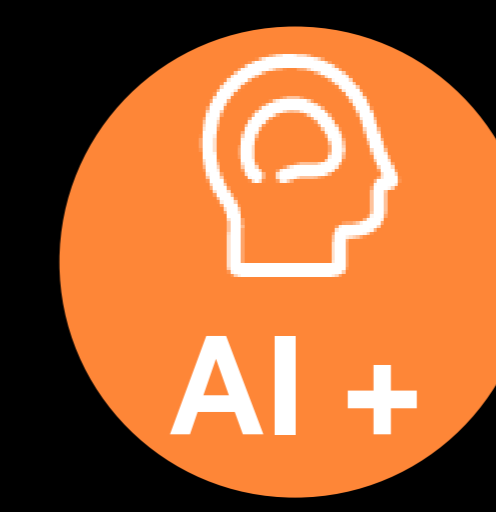
知识图谱



Expert Stage

专家阶段

Developing professional solutions
打造专业解决方案



Financial Services 金融服务



Healthcare 医疗



Smart City 智慧城市

Newborn Stage: To See

婴儿阶段：看

To See
“看”

Face Recognition 人脸识别



- Recognition precision **99.8%**
识别准确率达**99.8%**
- **1.78 billion** calls in 2018
2018年调用量**17.8亿次**
- Applied in **30+** sectors, including financial services, airport, etc.
应用于金融、服务、机场**30+**个行业

Micro-expression Recognition 微表情识别



- Recognition within **1s**
1秒内迅速识别
- Worldwide #1 recognition precision **96%**
准确率**96%**全球第一

Vehicle Damage Assessment 图像定损



- Image based damage assessment precision **92%**
图像定损准确率**92%**
- Assessment within **seconds**
秒级定损
- **99%** vehicle types covered
覆盖市面**99%**定损车型

Medical Image Analysis 医疗影像分析



- **20X** times faster in image analysis
读片速度提升**20倍**
- **40+** diseases covered
可检测**40+**种疾病

婴儿阶段：听

To Hear “听”

Voiceprint Recognition 声纹识别



- Recognition precision **99%+**
识别准确率**99%+**
- Recognition within **5s**
5s内快速识别
- **60+** scenarios covered, including voiceprint authentication, blacklist monitoring, etc.
覆盖声纹核身、黑名单检测等**60+**种场景

Automatic Speech Recognition 语音识别



- Recognition precision **93%+**
识别准确率**93%+**
- **50 million+** hrs for training per year
每年**5000万+**小时语音数据用于训练
- **70+** scenarios covered, including smart quality testing, service assistant, etc.
覆盖智能质检、坐席助手等**70+**种场景

Emotion Recognition 情绪识别



- Recognition precision **90%+**
识别准确率**90%+**
- Recognition within **3s**
3s内迅速识别
- **40+** scenarios covered, including customer emotion recognition, complaint recognition, etc.
覆盖客户情绪识别、投诉倾向识别等**40+**场景

婴儿阶段：说/读

To Speak “说”

Text To Speech 语音合成



- **2.5+ million** transcripts covered
覆盖**250万+**录音文本
- MOS¹ score **4.4 ± 0.05**, close to professional announcer level (4.58)
MOS评分**4.4 ± 0.05**, 接近专业播音员水平
- **50+** scenarios covered including insurance renewal, sales, etc.
覆盖车险续保、保险销售等**50+**种场景

Text Robot 文本机器人



- **91%+** dialogue precision
问答准确率**91%+**
- **95%+** dialogue generated by robots
机器人问答占比**95%+**
- **30+** scenarios covered, including wealth management, credit card, etc.
覆盖财富管理、信用卡等**30+**个场景

Semantic & Sentiment Analysis 语义情感分析



- **93%+** analysis precision
分析准确率**93%+**
- **50000+** public sentiment analysis per day
50000+篇/日舆情情感分析
- **50+** scenarios covered, including quantitative investment, enterprise risk assessment, etc.
覆盖量化投资、企业风险等**50+**个场景

To Read “读”

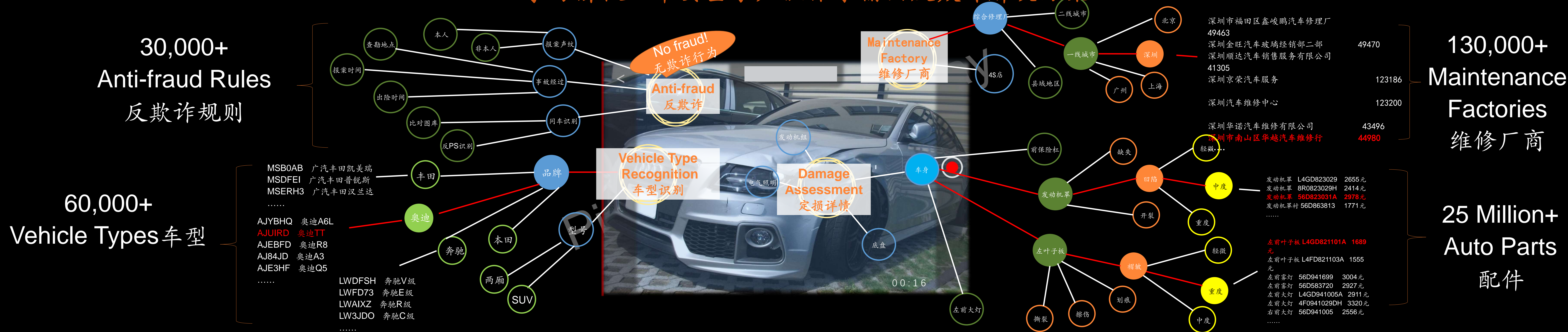
Learning Stage: Ping An Builds Professional Auto Knowledge System

学习阶段：平安构建专业的汽车知识体系



Learning Stage: Ping An Provides Anti-fraud Solution Based On Knowledge Graph

学习阶段：平安基于知识体系输出反欺诈解决方案



30,000+
Anti-fraud Rules
反欺诈规则

60,000+
Vehicle Types 车型

130,000+
Maintenance
Factories
维修厂商

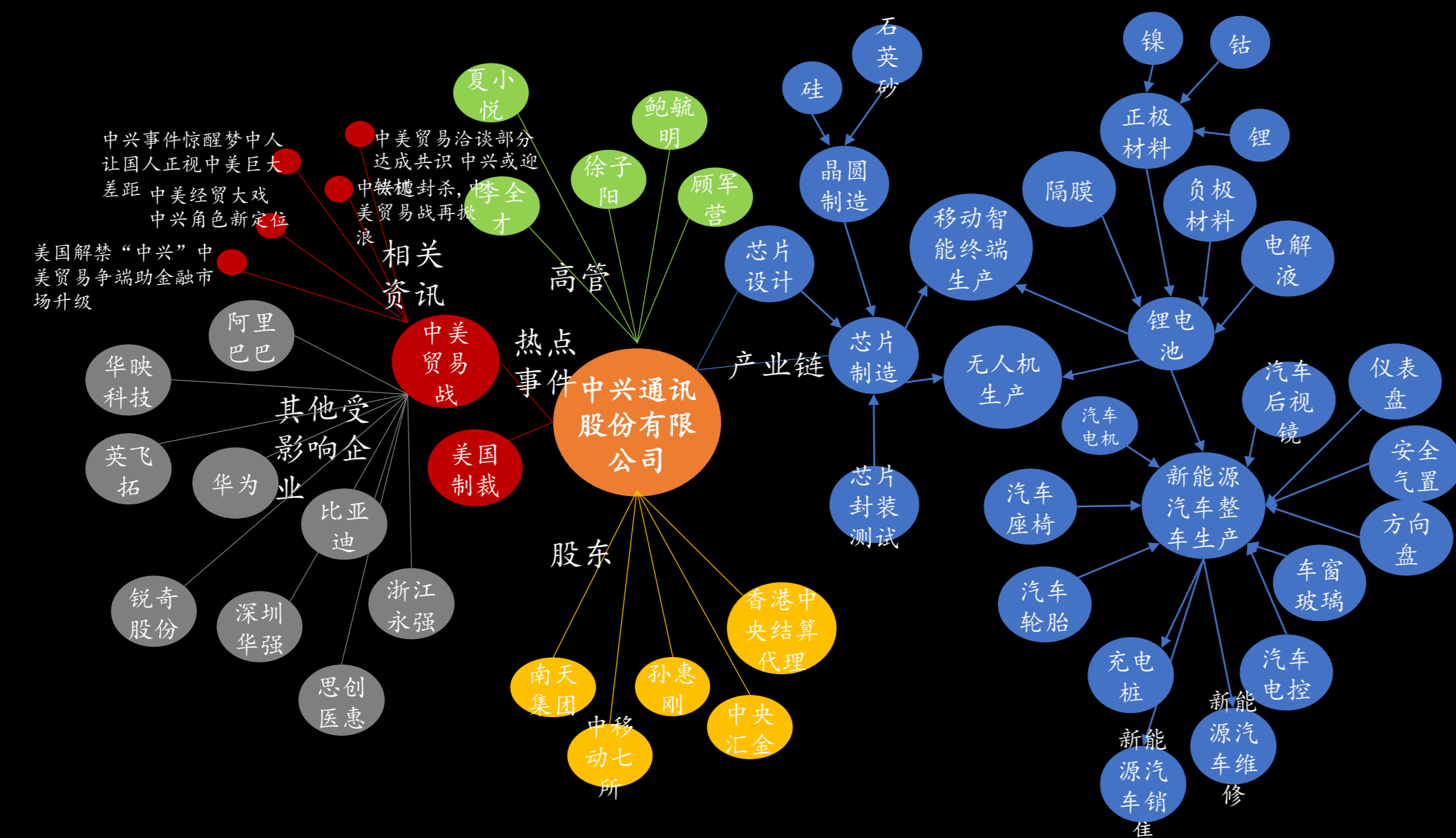
25 Million+
Auto Parts
配件

Learning Stage: Ping An Builds Knowledge Graphs In Various Fields

学习阶段：平安建立多个领域的知识图谱体系

Financial Knowledge Graph

金融知识图谱



910m+

relation types
关系总数

112m+

human entities
人物实体

230m+

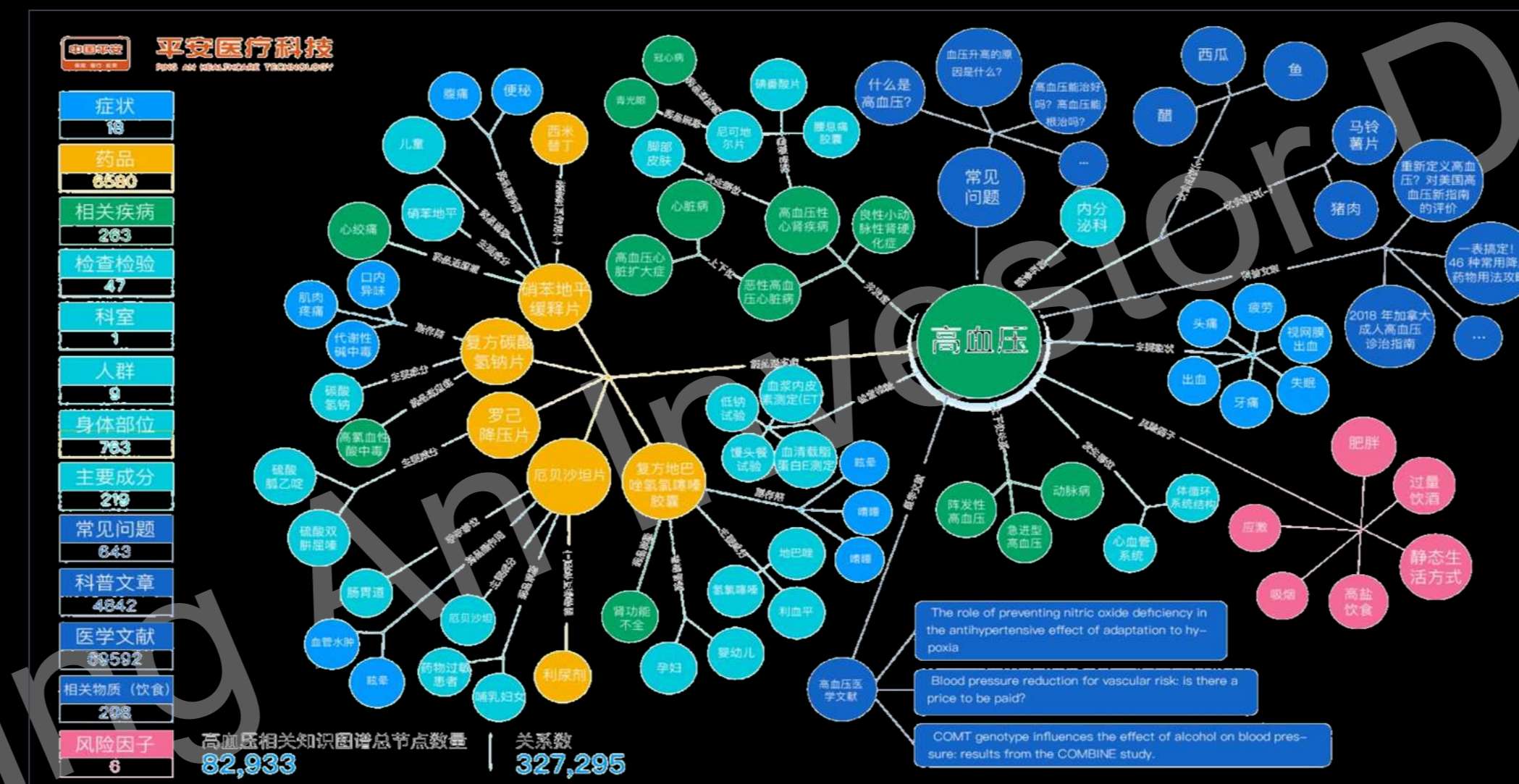
relation nodes
关系节点

84m+

enterprise data
企业数据

Medical Knowledge Graph

医疗知识图谱



500k+

medical terms
医学术语

5m+

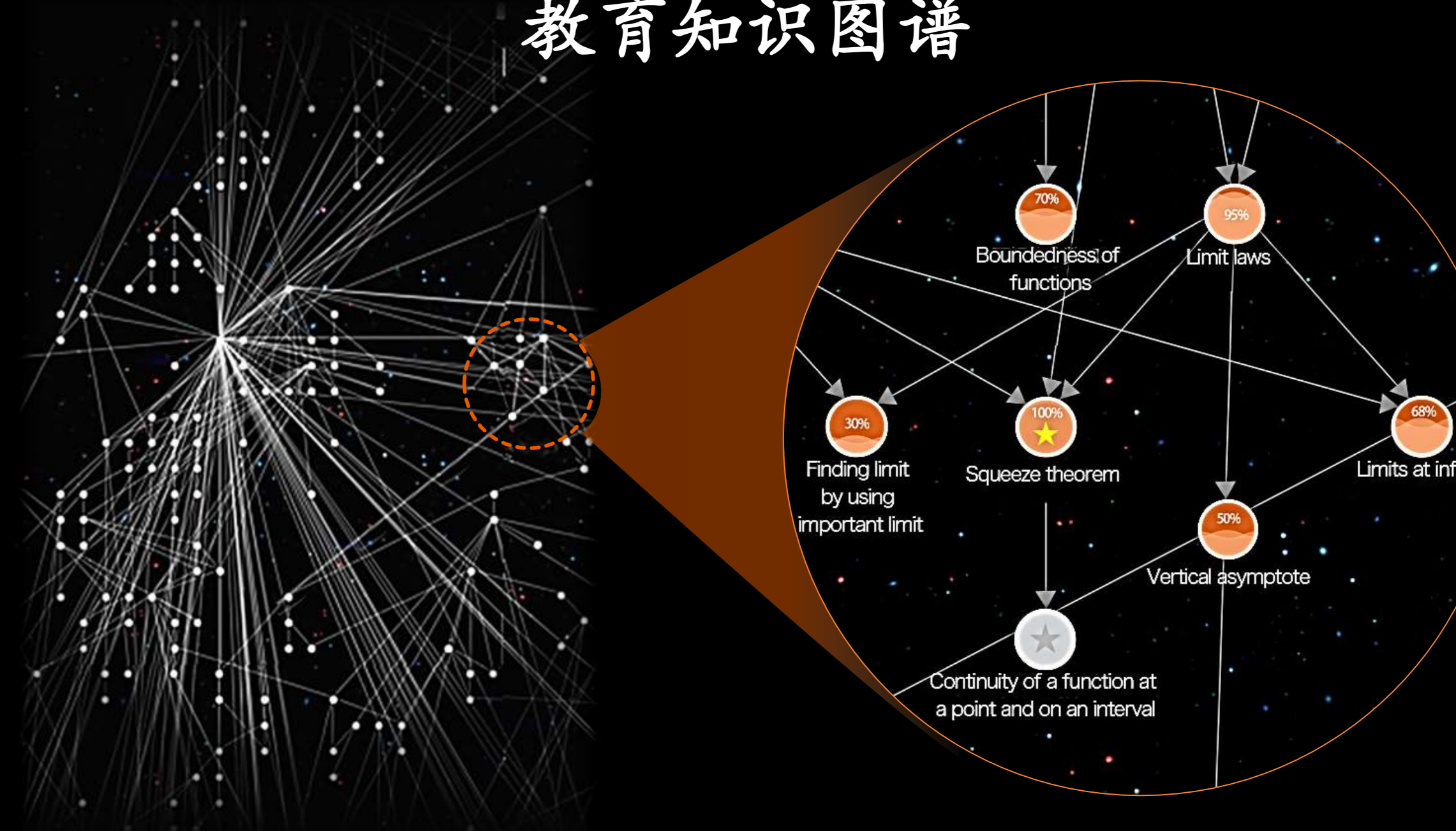
medical relations
医学关系

10m+

medical evidence
医学证据

Educational Knowledge Graph

教育知识图谱



Worldwide schools and K12~college subjects covered

国内外、全学段、全科目覆盖

10,000+

knowledge points
知识点

1,000+

faculty/student profile labels
师生画像标签

Professional Stage: Ping An Provides Smart Business Solutions

专业阶段：平安输出智能化解决方案



Scenarios
场景层

AI+ Sales

- Profile Analysis
- Smart Recommendation
- Intelligent Outbound call

AI+ Product

- Product Design
- Product Pricing
- Product Experience

AI+ Risk Management

- Individual Risk Management
- Enterprise Risk Management

AI+ Service

- Multi-mode Identity Verification
- Service Robots
- Automatic Claim Processing

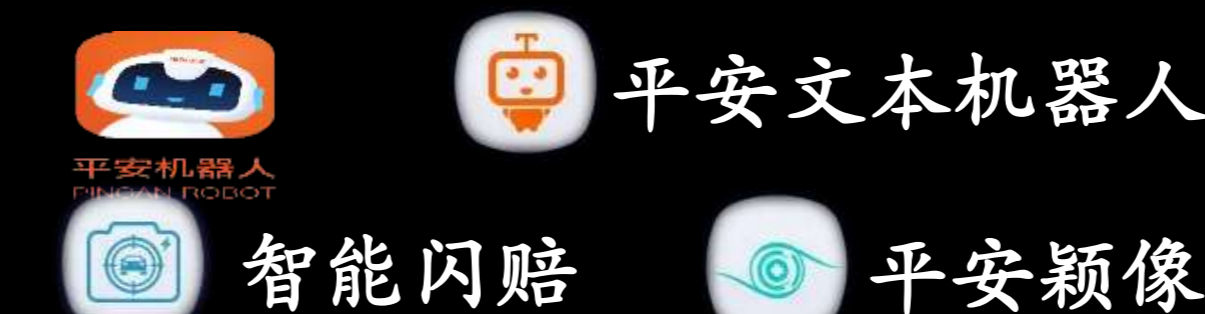
AI+ Operations

- Disease Forecast
- Smart Dispatching
- Smart Underwriting

AI+ Creation

- AI Composer
- AI Writing
- AI Painting

Products
产品层



Technology
技术层

Analysis
分析

Classification
归类

Perception
认知

Decision
决策

Monitor
监控

Deep AI
深度智能

Data
数据层

Aquisition
采集

Cleansing
清洗

Integration
整合

Standardization
标准化

Quality Control
质量控制

Security
安全

Profiling
画像

Deep Dive: AI in Financial Services

平安金融服务案例

Ping An Investor Day



Hannah Qiu

邱寒

Ping An OneConnect

金融壹账通

Executive VP and Chief Innovation Officer

副总经理兼首席创新官

350+ Researchers in Gamma Lab

• 加马研究院共有350+名研究员



AI Product Head
AI产品负责人



Big Data Head
大数据负责人



AI Engineering Head
AI工程化负责人



Chief Big Data Scientist
首席大数据科学家



Hannah Qiu 邱寒
Founder 研究院创始人



America Lab Head
美国研究院院长



Computer Vision Research Head
计算机视觉负责人



Image Recognition Research Head
图像识别负责人



NLP Research Head
自然语言处理负责人



Holistic AI+ Financial Services

AI+ 金融：构建基于AI的端到端解决方案

Bank
银行

Insurance
保险

Investment
投资



AI+ Sales: Full Channel Coverage Through 3 Solutions

智能营销：3大解决方案覆盖线上线下全场景

AI+Online Sales

线上

Channels / Media

汽车之家
autohome.com.cn
2 million
Partners
China unicom 中国联通

DSP

1.5X
higher conversion rate

AI+Offline Sales

线下

Branches

Gamma Mirror

Sales Agents

Gamma RM APP

Wealth Advisors

Gamma eExpert
基于知识图谱的金融产品问答
自动化会议摘要抽取

Online-Merge-Offline

线上线下结合

Social media

App

Tele-marketing

T1: Customer
T2: VIP
T3: Agent

AI+ Sales Case Example: Gamma eExpert

智能营销案例

Gamma eExpert



Answers customers' question on financial products without prior setup
智能回答客户的金融产品问题，无需提前设置

Automatically records key information from conversations with customers
自动记录客户交谈中的主要信息点

Rich built-in financial database
内置丰富的金融行业数据库

Seamless connection with the CRM system of the company
与公司CRM系统实时无缝连接

Impact 效果

1s

Complete customer Q&A setup for new products
完成新产品客户问答设置

91%

Accuracy rate of Interpretation on all financial text
任意金融文本的机器阅读理解准确率

Demonstration for Gamma eExpert

智能销售助手视频展示



Smart Q&A based on NLP
基于NLP的智能问答金融产品信息

Automatic Recording
自动记录交互信息

Video not broadcasted 视频不在线直播

AI+ Risk Management: End-to-end Intelligent Risk Management Solution

智能风控：构建基于AI的端到端全流程智能风控解决方案

Pre-Approval 贷前预审

Intelligent
Anti-fraud
设备反欺诈

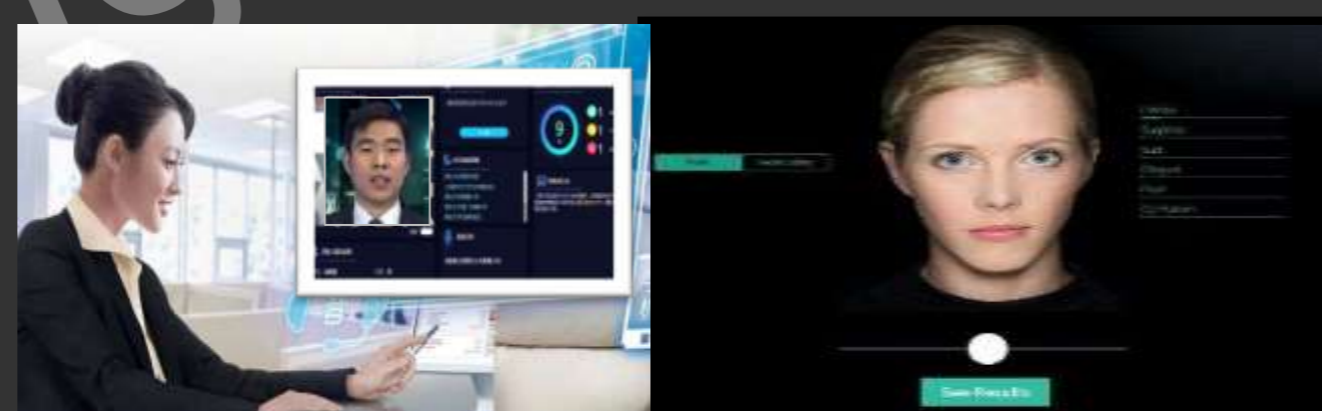


Intelligent Risk
Engine
智能决策引擎



Loan Approval 贷中审批

Micro-Expression
Recognition
微表情面审



Intelligent Credit
Approval
定制评分卡



Post-Loan 贷后管理

Intelligent
Collection
智能催收



Intelligent
Monitoring
智能监控



AI+ Risk Management Case Example 1: Device Anti-fraud Detection

智能风控案例1：设备反欺诈



Impact 效果

80%+

Fraud risk mitigation
欺诈风险缓释

\$45B

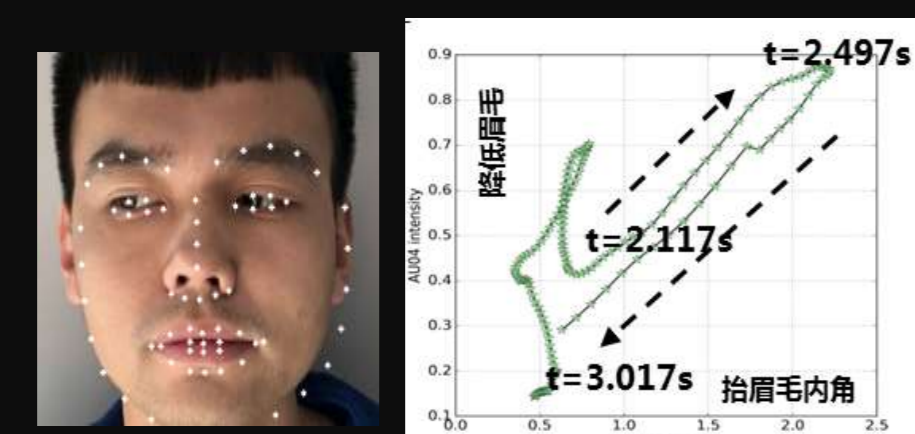
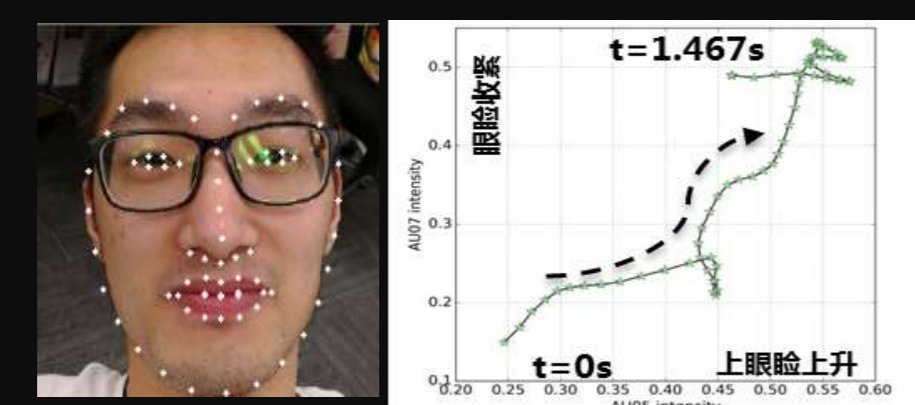
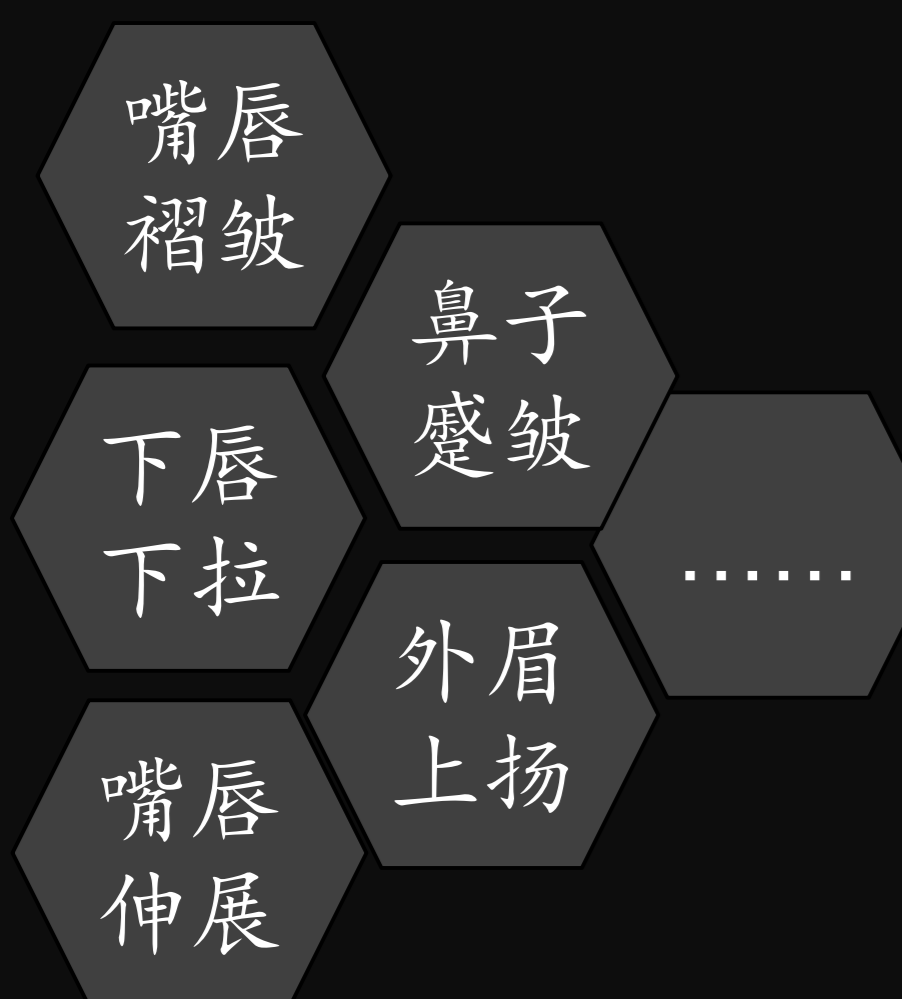
Loss reduction through ~15 mn fraud identification in 2018 YTD for 672 FIs
2018年截至目前为672家机构减少损失金额(通过~1500万次欺诈识别),



Micro-expression Methodology

微表情方法论

- Recognition and analysis of micro expressions through neural network
- 通过神经网络辨识、分析微表情



Vertical



Horizontal



智能风控案例2: 微表情面审

Application in Interview System

面审系统应用

- 2.5X** New sales 新增销售
- ↓100%** Number of sites 门店数
- ↓67%** Delinquent rate 逾期
- ↓39%** Cost ratio reduction 费用率↓39%



Impact 效果

NO.1

2018 Global OMG Challenge
2018年OMG国际微表情评测屏排名

96%

Micro-expression Recognition Accuracy
微表情识别准确率

67%

Credit losses reduction
贷款场景信贷减损

Demonstration for Micro-expression Interview System

微表情面审视频展示

Micro-expression Recognition
微表情识别

Fraud Detection
欺诈识别

Video not broadcasted 视频不在线直播

AI+ Service: Based on Advanced End-to-end Voice and Semantic Technology

智能客服：依托先进的端到端语音、语义技术

Online Customer Service 线上客服辅助

Offline Customer Service 线下网点客服辅助

Tele Customer Service 电话中心客服辅助

Chatbot
聊天机器人



Voicebot
语音机器人



1:N Facial Recognition
1:N人脸识别



Offline Product Recommendation Engine
线下产品推荐引擎

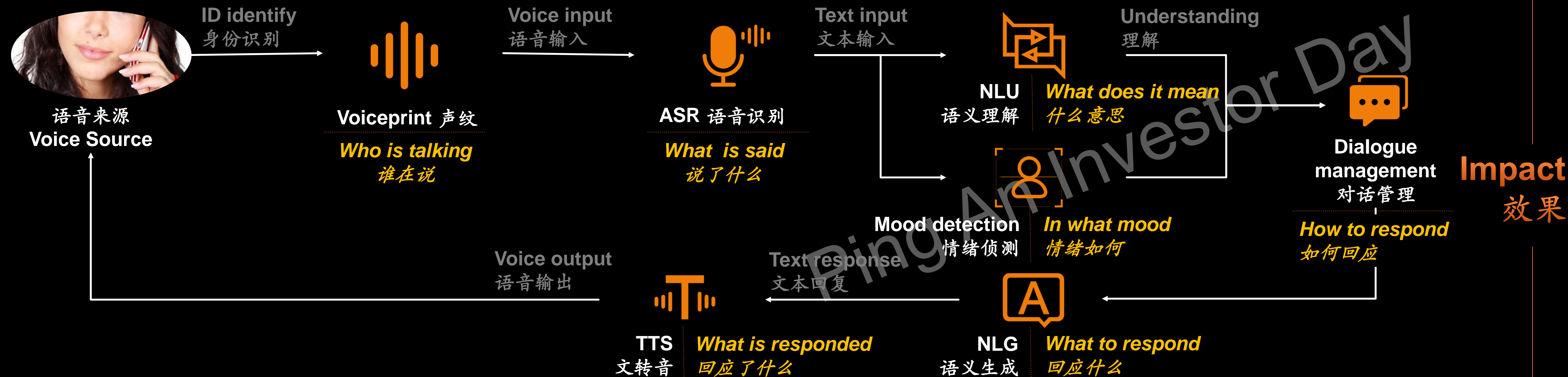


AI Assistant
智能坐席助手



AI+ Service Case Example: Smart Online Customer Service

智能客服案例



Impact 效果

~400mn

Number of services
服务客户次数

~70%

% of bot services
机器人服务占比

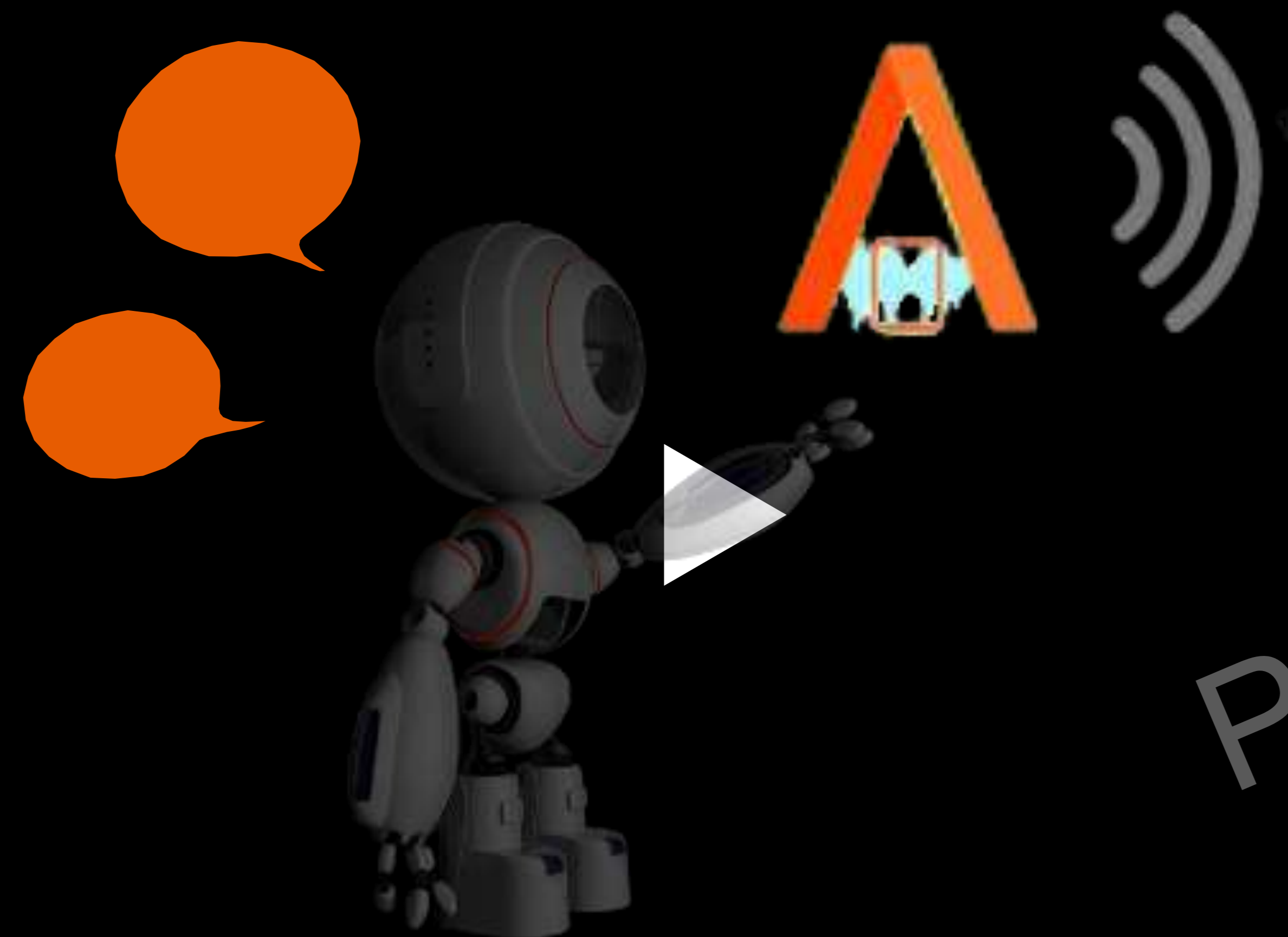
30%

Manpower saved
电话客服人力节约

Impact 效果

Demonstration for Smart Online Customer Service

智慧客服视频展示



Ping An Investor Day

Voiceprint
recognition

声纹识别

Natural Language
understanding

自然语言理解

Dialogue
management

对话管理

Video not broadcasted 视频不在线直播

Deep Dive: AI in Healthcare

平安医疗科技案例

Ping An Investor Day



Geoff Kau

高孟轩

Ping An Smart City
Executive Vice President

平安智慧城
副总经理



Guotong Xie

谢国彤

Ping An Technology
Chief Healthcare Scientist

平安科技
首席医疗科学家

Ping An Invest

We have one of the strongest scientist teams in AI healthcare sector

我们拥有一支极强大的AI医疗科学家团队



Leader of Personalized Treatment Department
个性化精准诊疗部负责人
20+ years of AI clinical decision support experience
20+年智能诊疗经验



Leader of Medical Image Analysis Department
医学影像分析部负责人
15+ years of AI medical imaging experiences
15+年智能医疗影像经验



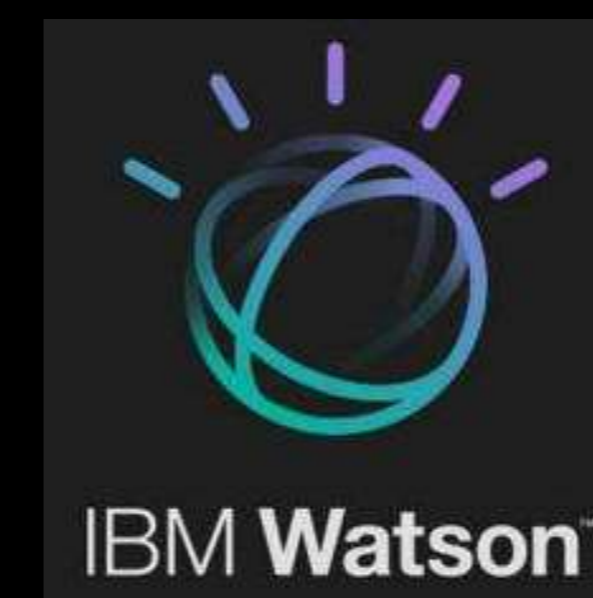
Deputy of PAT, US Research Lab (Washington)
平安科技美国研究院（华盛顿）执行院长
20+ years of AI medical imaging experiences
20+年智能医疗影像经验



Executive Vice President
副总经理
15+ years consulting & Silicon Valley startup
咨询与硅谷创业



Chief Healthcare Scientist
首席医疗科学家
15+ years of AI R&D experiences
15+年人工智能研究经验



Leader of Medical Semantic Analysis Department
医疗文本理解部负责人
10+ years of big data and AI R&D experience
10+年大数据人工智能经验



Leader of AI Clinical Decision Support
智能诊疗团队负责人
15+ years of AI R&D experience
15+年人工智能科研经验



Leader of AI medical prediction
医疗智能预测团队负责人
15+ years of AI R&D experiences
15+年人工智能研究经验



Our End-to-End Smart Healthcare Management Platform

我们致力于打造端到端的智能医疗管理平台

平安医疗科技
PING AN HEALTHCARE TECHNOLOGY

Smart Disease Prediction 智能疾病预测

Patients
患者

-  Individual Risk Prediction
个体风险预测
-  Precise prevention advice
精准预防建议

Doctors/Medical
Institutions
医护人员/医疗机构

-  City Health Index Prediction
城市健康指数预测
-  Population Trend Forecast
群体趋势预测

Government
政府/卫健委

Smart Medical Imaging 智能影像筛查

-  Disease Screening
疾病筛查
-  Assisted Imaging
Diagnosis
辅助影像诊断

-  Remote consultation and
smart report
远程会诊及智能报告

Smart Clinical Decision Support 智能辅助诊疗

-  Assisted Diagnosis
辅助诊断
-  Drug Recommendation
用药推荐
-  Risk Assessment
风险评估

Smart Medical Quality Control 智能医疗质控

-  Online
Referral/Consultation
线上转诊/会诊
-  Expert Troubleshooting
专家疑难阅片
-  Radiation Quality Control
放射质控
-  Pathology Quality Control
病理质控

Smart Patient Follow-up 智能随访患教

-  Intelligent Patient
Education Q&A
智能患教问答
-  Automatic Follow-up
Dialogue
自动随访对话

Smart Disease Prediction: Accurate disease models through 2-step solutions

智能疾病预测：通过两步骤解决方案建立精准疾病预测模型

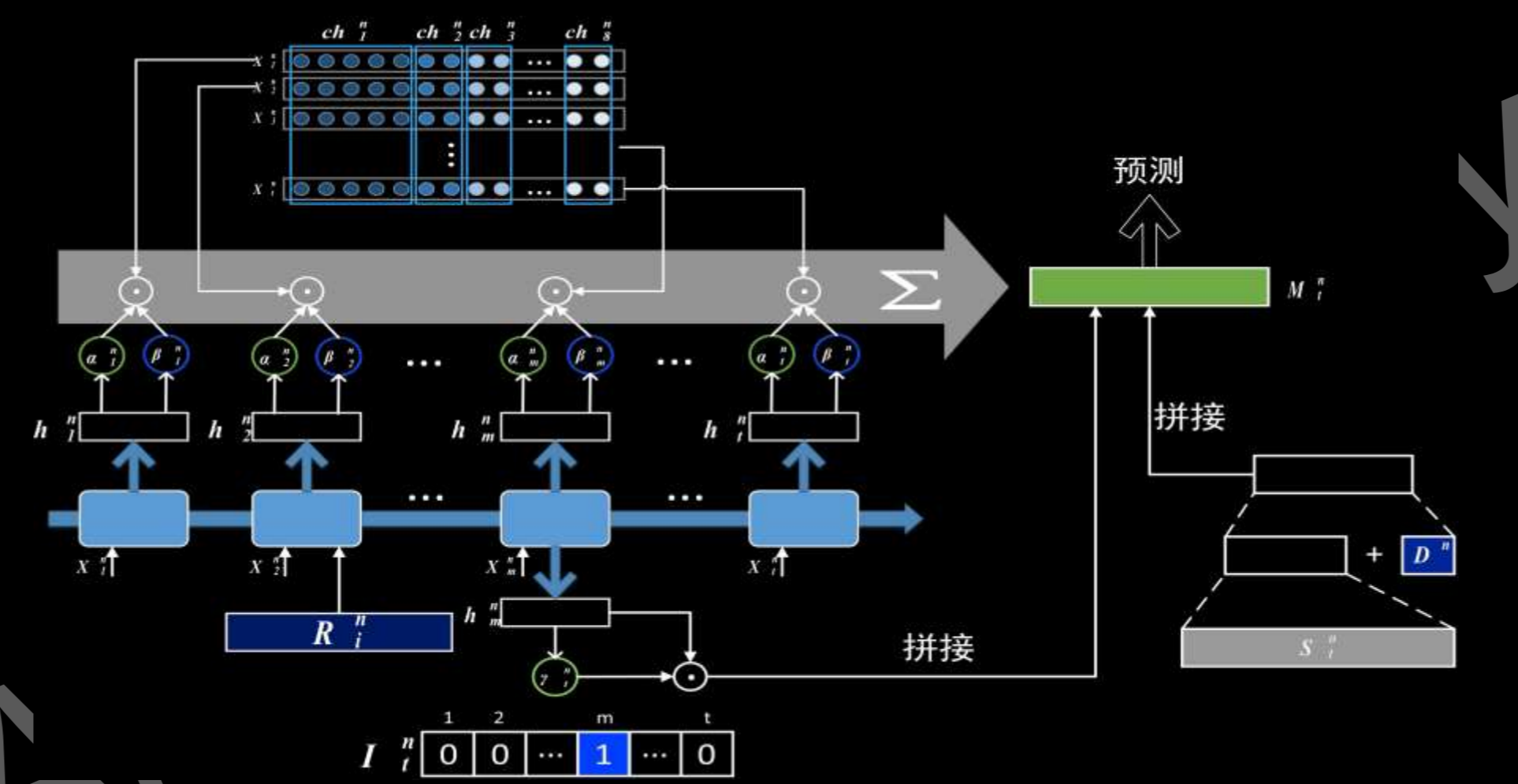
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Step1

第一步

Deep learning and ensemble learning to build precise prediction models

深度学习和集成学习方法建立精准预测模型



~50%

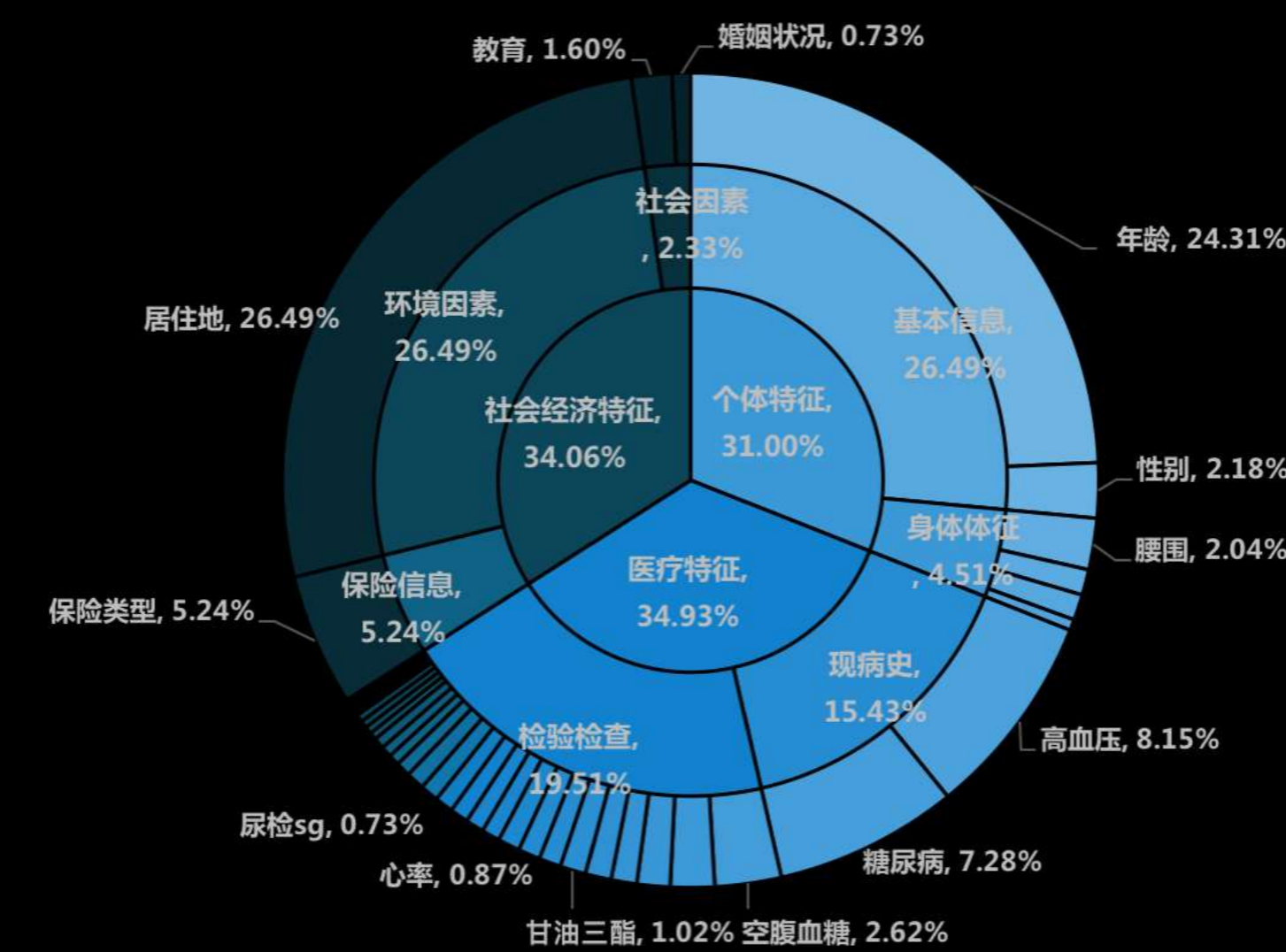
Increase in sensitivity compared to existing models
精准性提升

Step2

第二步

Factor Analysis and Interpretation for Non-linear Model

非线性模型的因子分析和解释



~500

Risk factors discovered from data
风险因子通过数据挖掘得到

疾病预测用例：落地实现城市健康指数及个人疾病风险预测

City Health Index Prediction 城市健康指数预测



Personal Disease Risk Prediction 个人疾病风险预测



Impact 效果

~90%

Prediction Accuracy Rate
疾病预测精度

40+

Disease Prediction Models
疾病预测模型

Smart Medical Imaging: Offer 40+ imaging models with high accuracy rate

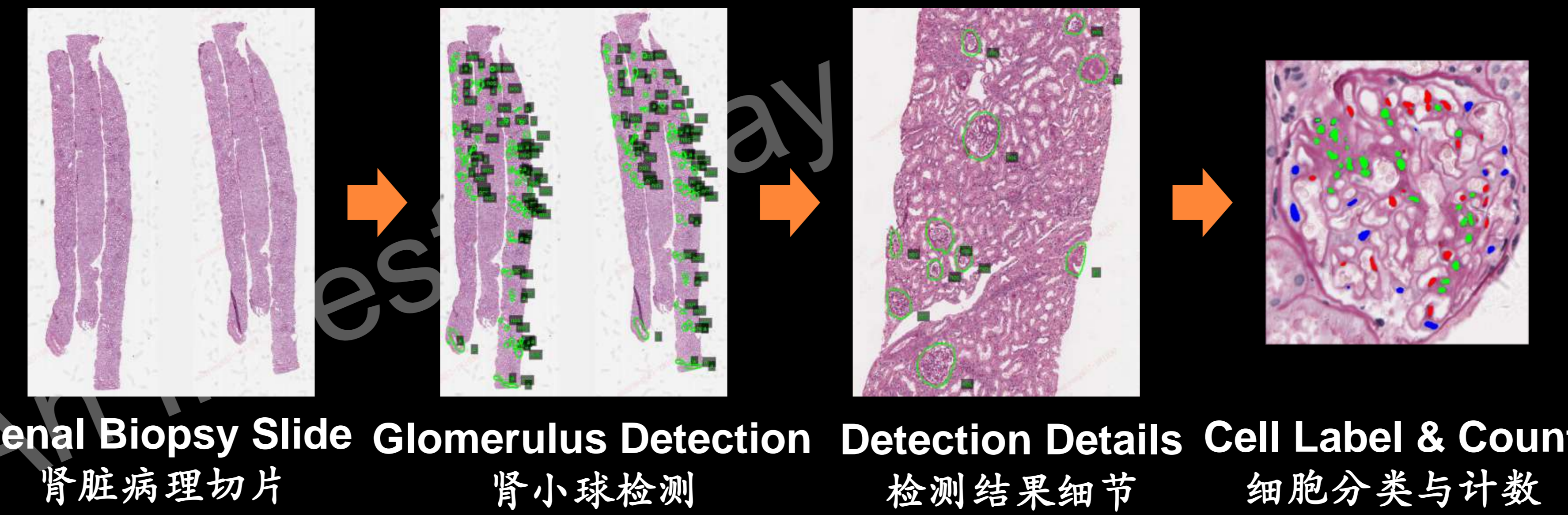
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40+ Imaging models
40+种影像筛查模型



智能影像筛查：提供40+种高精度影像筛查模型

Kidney Pathological screening 肾脏病理筛查



OCT (Optical Coherence Tomography) screening OCT (光干涉断层成像) 筛查



Impact 效果	
>90%	Accuracy Rate 疾病预测精度
NO. 1	Global LUNA (Lung Nodule Analysis) Competition 全球肺结节比赛
NO. 1	Global Gastric Cancer Pathology Competition 全球胃癌病理比赛
NO. 1	Global Diabetic Retinopathy Competition 全球糖网比赛

Smart Clinical Decision Support: 5 medical databases covering ~30k disease types

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智能辅助诊疗：5大医疗数据库覆盖~3万种疾病

~30k

Disease Types
疾病种类

Diabetes
as an
example
以糖尿病为例

Drug Database
药品库

~2000 drug information
~2000个药品信息

Disease Database
疾病库

~180 related diseases
~180种相关疾病

Prescription Database
处方/治疗库

~25k medical literatures
~25万个医学文献

Health Factor Database
健康因子库

~50 risk factors
~50个风险因子

Doctor/Medical Institution Database
医生/医疗机构库

~15000 doctor information
~15000名医生信息

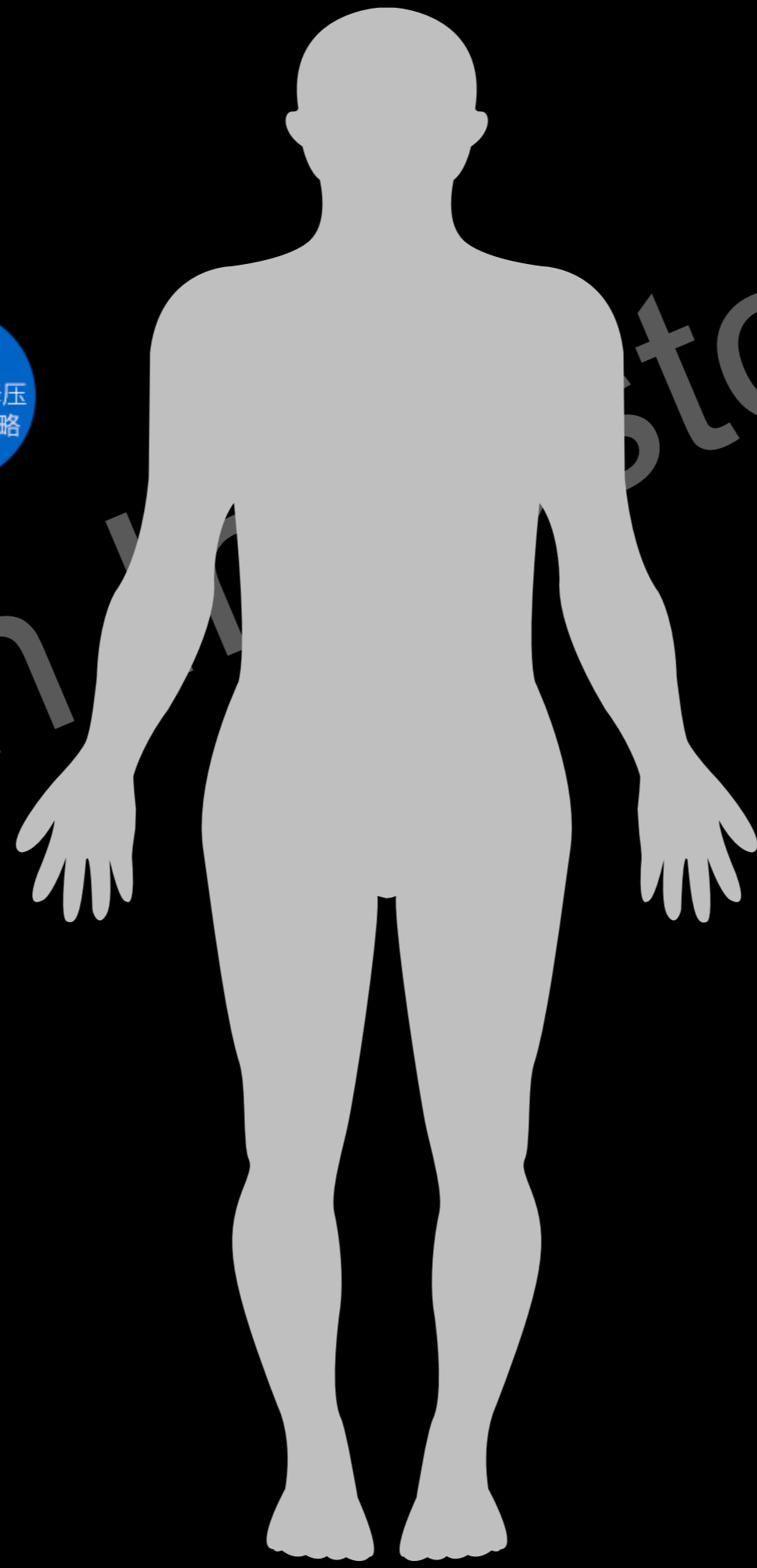
Clinical Decision Support Example: Build Medical Knowledge Graph

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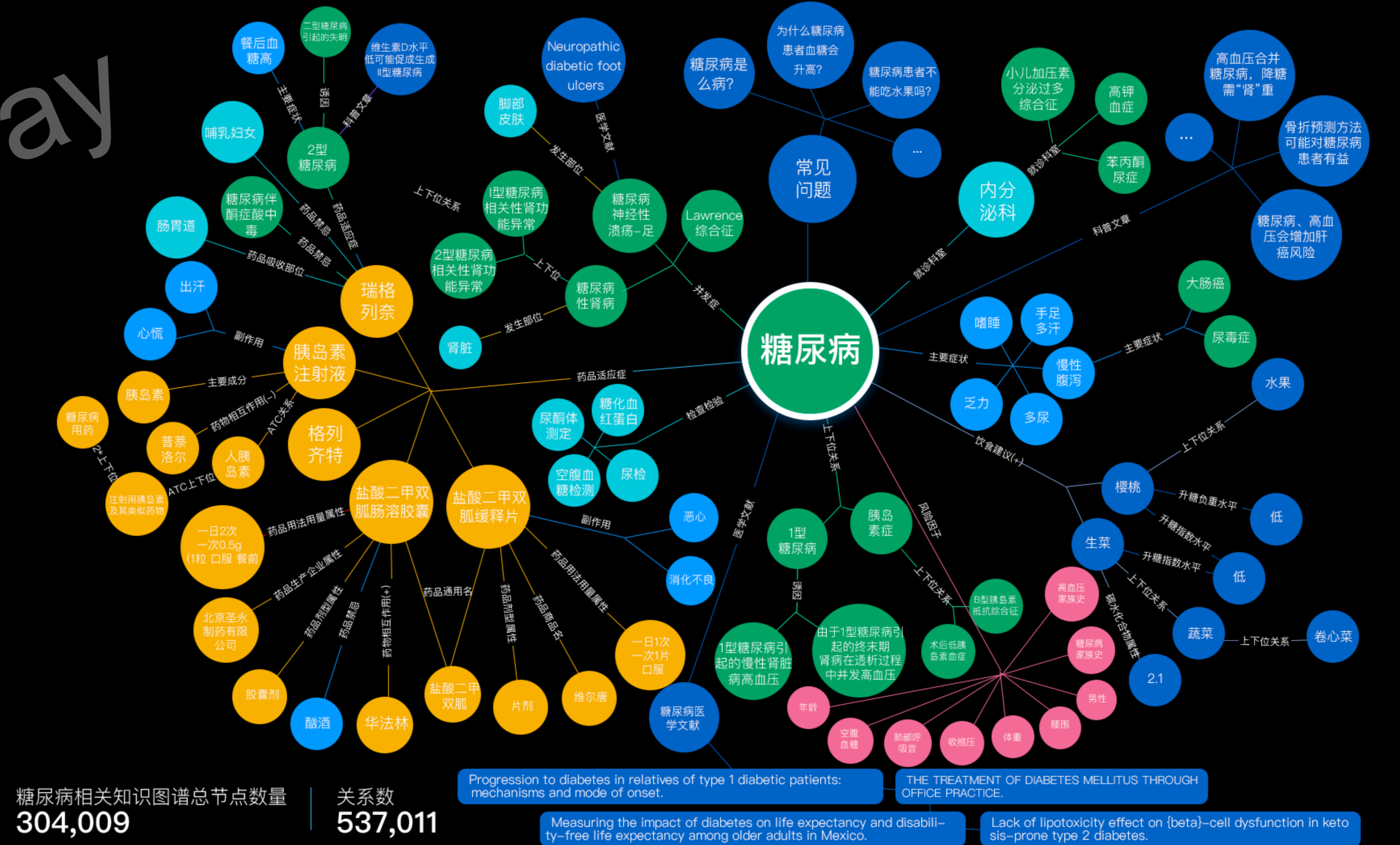
智能辅助诊疗用例：构建医疗知识图谱

Hypertension and Diabetes as examples
以高血压和糖尿病为例

症状	18
药品	6580
相关疾病	263
检查检验	47
科室	1
人群	9
身体部位	763
主要成分	219
常见问题	643
科普文章	4842
医学文献	69592
相关物质 (饮食)	298
风险因子	48



症状	88
药品	1916
相关疾病	173
检查检验	47
科室	1
人群	4
身体部位	89
主要成分	249
常见问题	700
科普文章	50000
医学文献	250000
相关物质 (饮食)	167
风险因子	48

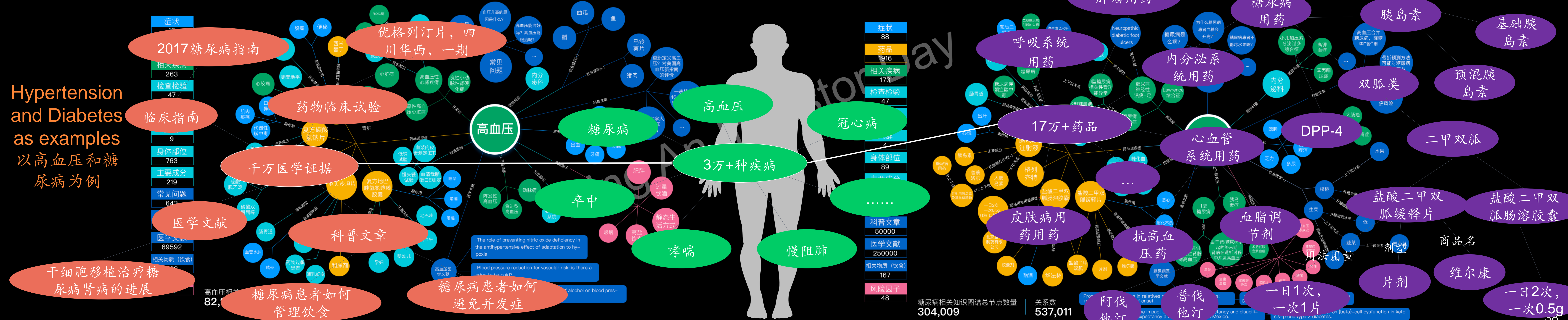


Clinical Decision Support Example: Build Medical Knowledge Graph

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智能辅助诊疗用例：构建医疗知识图谱

Hypertension and Diabetes as examples 以高血压和糖尿病为例



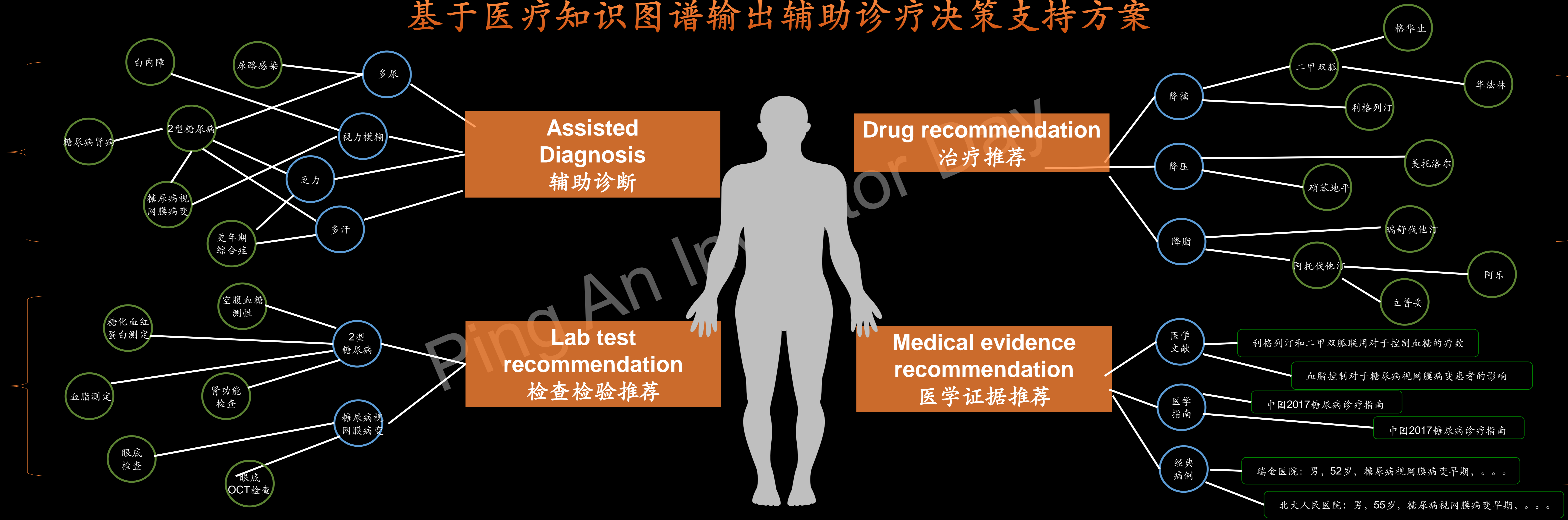
Provide clinical decision support based on Knowledge Graph

基于医疗知识图谱输出辅助诊疗决策支持方案

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Assist diagnosis based on disease-symptom relationship
基于疾病与症状关系辅助诊断

Recommend lab test based on disease-test relationship
基于疾病与检查检验关系推荐检查检验



Offer drug recommendation based on drug-disease relationship and drug interactions

基于疾病药品关系及药物相互作用推荐用药

Recommend medical evidence base on guidance, literature and similar cases

基于指南、文献以及相似病例推荐医疗证据

Demonstration for Medical Knowledge Search and Decision Making Support Engine

AI
医疗

智能医学知识搜索和决策引擎展示

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Investor Day

~30k

Disease Types
疾病种类

5

Medical Knowledge Databases
医疗知识库

Video not broadcasted 视频不在线直播

亮点及重点

World's Leading AI Technologies

世界领先人工智能技术

- Talented team with 1,000+ AI experts, 5 AI research institutes 5家AI研究院，由超过1000名AI科学家组成的顶级团队
- Cutting-edge technologies: #1 in 7 international contests 领先前沿技术，7项世界级比赛第一名

World's Leading AI Financial Services

世界领先金融服务人工智能

- OneConnect Provides 50+AI solutions, and serves ~3,000 financial institutions with 2.4 Bn+ inquiries 壹账通提供50+智能金融解决方案，服务3000余家机构，累计调用量超过24亿
- OneConnect Saved over \$45 Bn in fraud and prevented ~15mn frauds 壹账通累计成功阻止约1,500万次欺诈，减损金额超过450亿美金

World's Leading AI Healthcare

世界领先医疗人工智能

- No.1 in AI disease prediction, AI medical imaging and AI clinical support 在AI疾病预测、AI医疗影像及AI辅助诊疗领域均世界第一
- 5 world-class leading medical knowledge databases and 5 end-to-end smart healthcare services 五大世界级领先医疗知识库和五大端到端智能医疗服务