PERSONALIZED MEDICINE MEETS ARTIFICIAL INTELLIGENCE : A SYSTEMATIC LITERATURE REVIEW

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About the Authors

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The Need For AI in Personalized Medicine

Challenges

- One size fits all healthcare
- Variable patient responses
- Decision based on population averages

Opportunity

- Explosion of genomic, EHR & imaging data
- Data is large, complex and multidimensional

Why AI?

- Large scale pattern recognition
- Data driven individualized care

What is Personalized Medicine?

Tailoring prevention, diagnosis and treatment based on:

- Genetics
- Clinical History
- Environment
- Lifestyle

AI Enables:

- Varient detection
- Drug response prediction
- Risk stratification
- Clinical decision support

Research Questions

RQ 1. What techniques are adopted in the area of AI based personalized medicine?

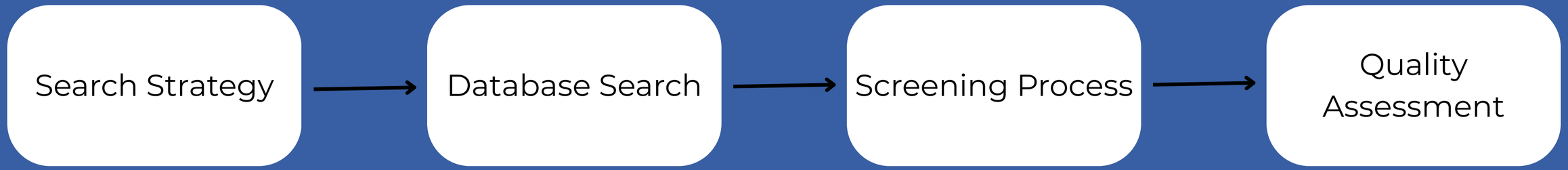
RQ 2. What tools are used when applying AI to personalized medicine?

RQ 3. What speciality is benefitted from the interaction of AI and personalized medicine?

Methodology

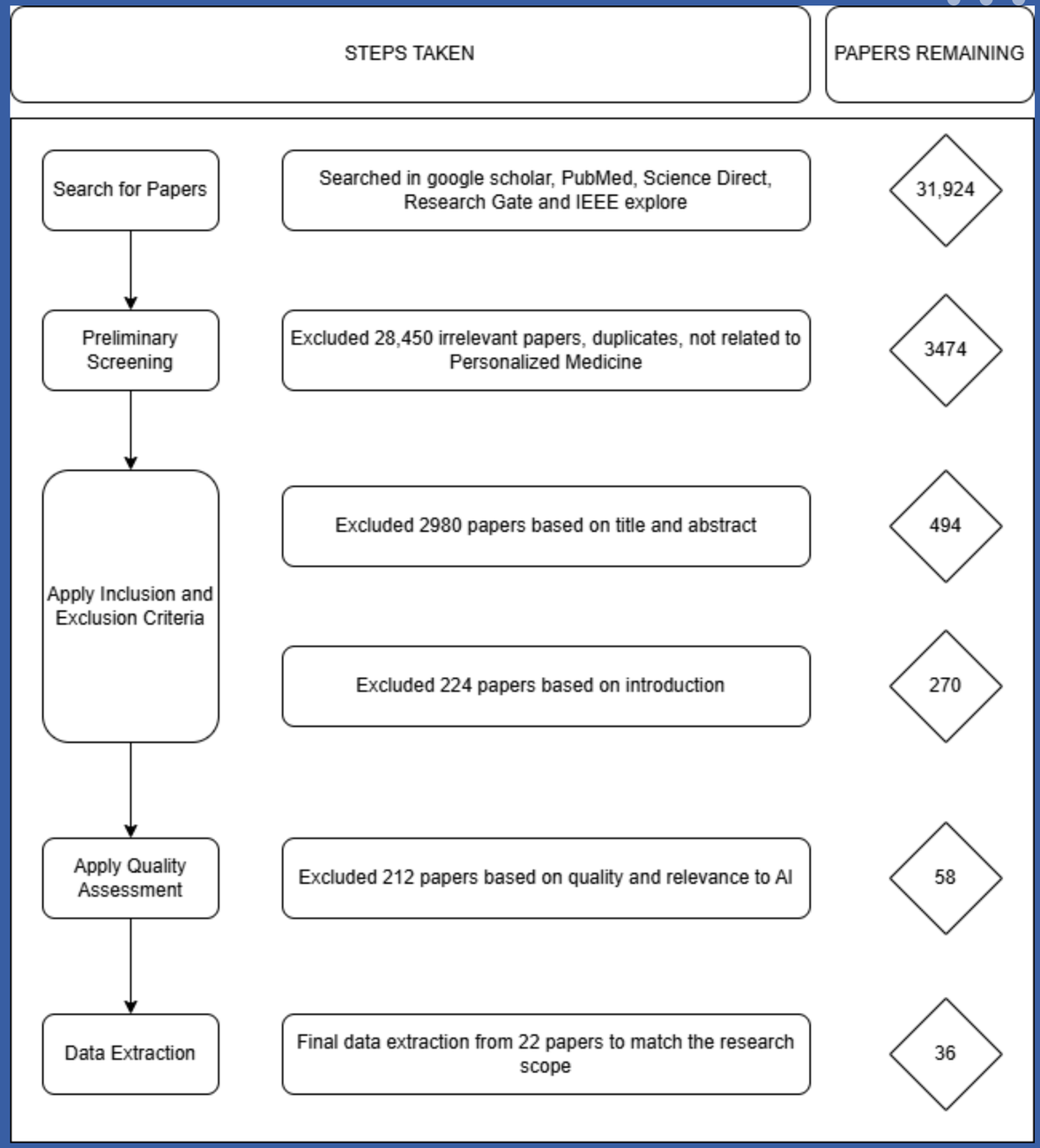
Framework Used: “Kitchenham’s Systematic Literature Review (SLR)”

Review Process

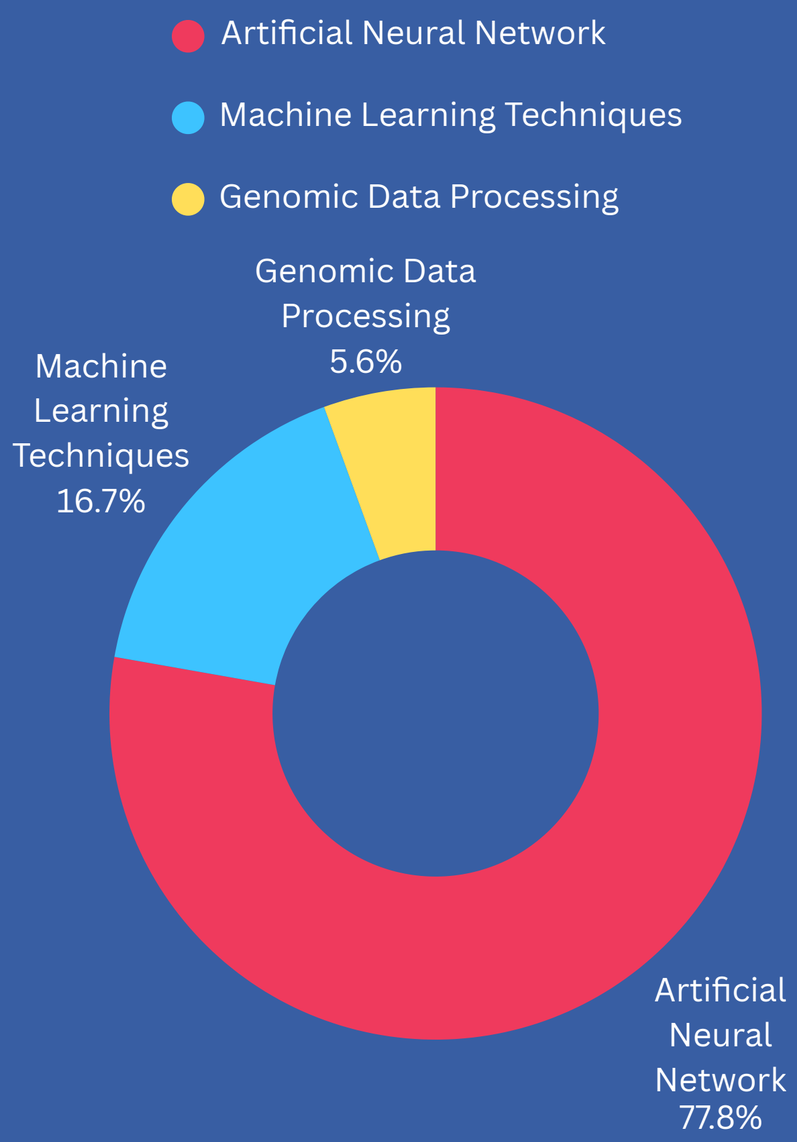


Study Selection Process

- Comprehensive database search
- Title and abstract Screening
- Inclusive and Exclusive Criteria enforced
- Quality assessment performed
- **36 Studies selected for final analysis**



AI Techniques in Personalized Medicine (RQ 1)



- Deep Learning based artificial neural networks dominate AI applications in personalized medicine

AI Tools And Platforms

Chat GPT

- Clinical Text Analysis
- Clinical Decision Support

CURATE. AI

- Personalized Drug Dosage
- Treatment Optimization

GATK

- Genome Analysis Toolkit
- Genomic Varient Detection

Da Vinci Surgical System

- AI assisted Robotic Surgery
- Improves Surgical Precision

Clinical Specialties

Oncology

- Cancer diagnosis
- Tumor classification
- Precision oncology treatments

Genomics

- Genetic mutation detection
- Presonalized treatment strategies

Radiology & Cardilogy

- Medical imaging analysis
- Disease risk prediction

Emerging Areas

- Neurology & Dermatology
- Dentistry & Public Health

Challenges

- Data Privacy & Ethics
- Model Interpretability
- Genomic Data Complexity
- Infrastructure & Cost
- Clinical Integration

Future Directions

- Scalable AI Frameworks
- Ethical & Regulatory Governance
- Bias Migitation
- Interdisciplinary collaboration

Conclusion

- AI is transforming personalized medicine
- Deep learning dominates current research
- Oncology and genomics lead adoption
- Responsible integration of AI is essential

THANK YOU