



Smart Energy Systems Lab



Research challenges

Massive amount of medical data and cumulative knowledge

Existing solution focus on performing diagnosis and storing doctors' treatment

No interactive learning from previous diagnosis and treatments

Proposed Solution

Build a dental semantic network (DSN) of all medical data and cumulative knowledge

Combine artificial intelligence-based diagnosis with treatment suggestion

Enable interactive learning from diagnosis and treatment history



Contributions

- Combine diagnosis with treatment
- Integrating the incremental learning framework to learn from medical diagnosis and treatment history
- Preserve expertise of after doctors' retirement by allowing continuous knowledge transfer
- Easy integration in digital healthcare systems

Tooth.AI – Smart Dental Disease Diagnosis Using X-Ray Scans

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Proposed Methodology

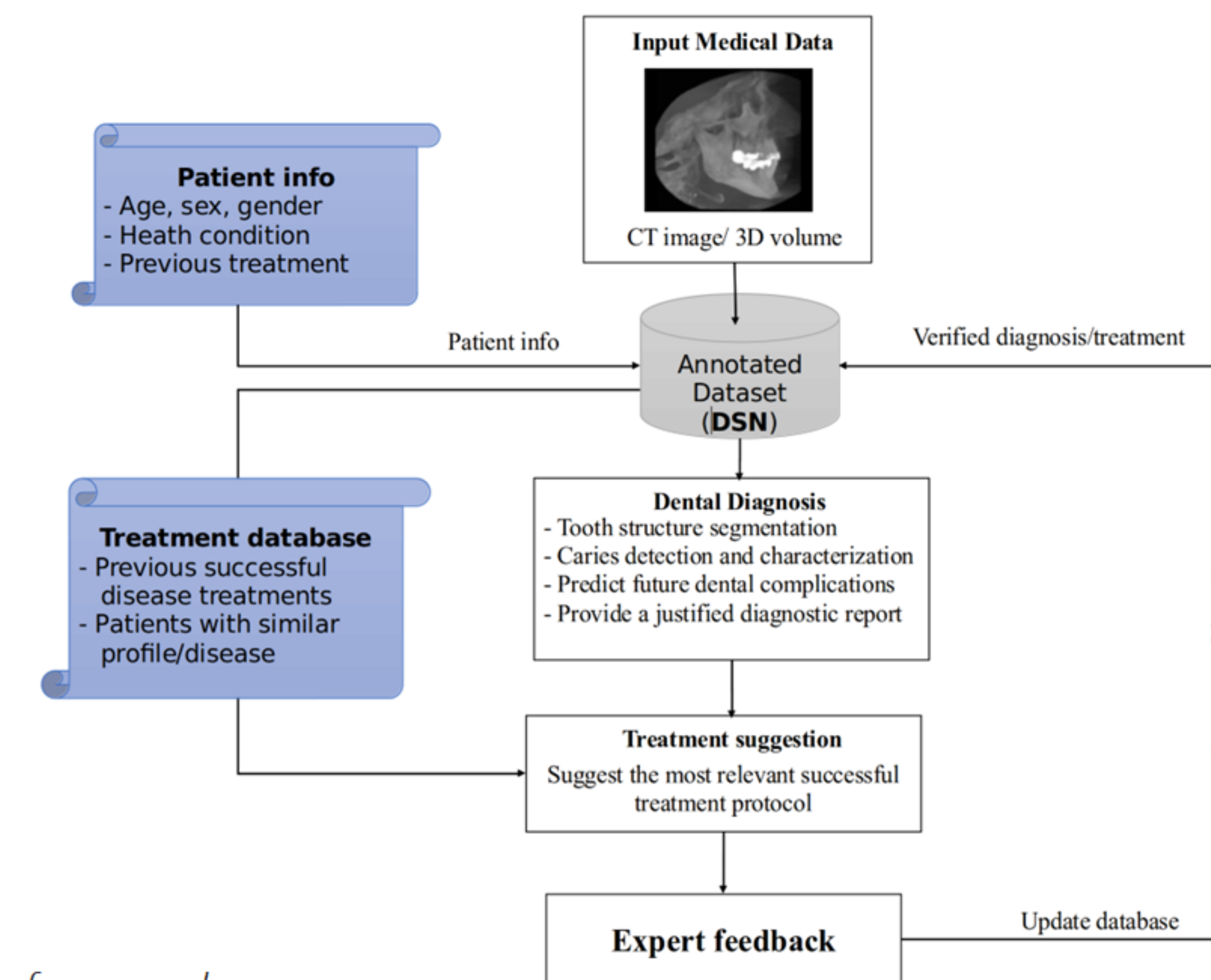
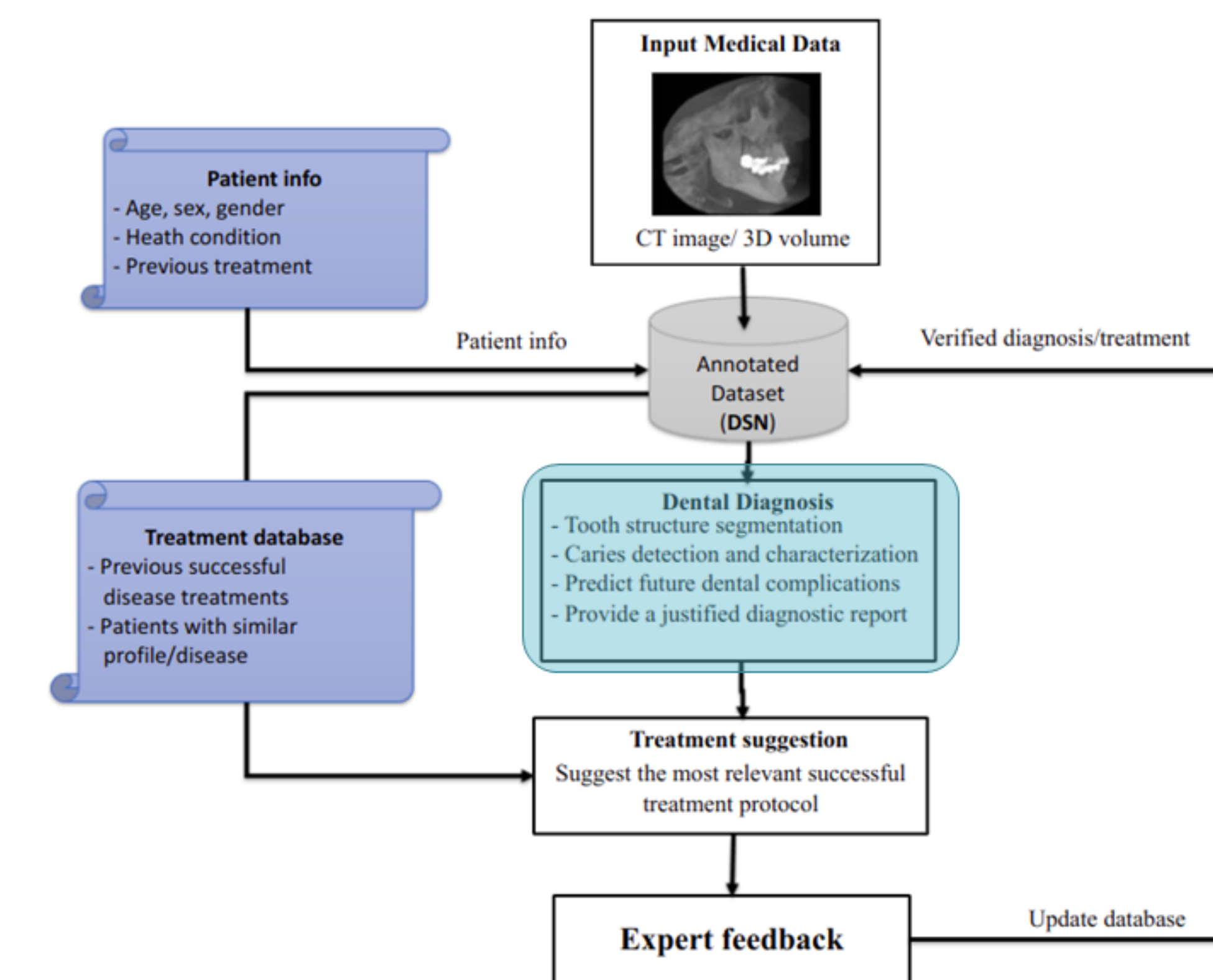


Figure. Tooth.AI toolbox framework

Dental Diagnosis



H. A. Gabbar, A. Chahid, M. J. A. Khan, O. Grace-Adegboro, and M. I. Samson, "Tooth.AI: Intelligent Dental Disease Diagnosis and Treatment Support Using Semantic Network," IEEE Syst. Man, Cybern. Mag., vol. 9, no. 3, pp. 19–27, 2023.

Dental Diagnosis

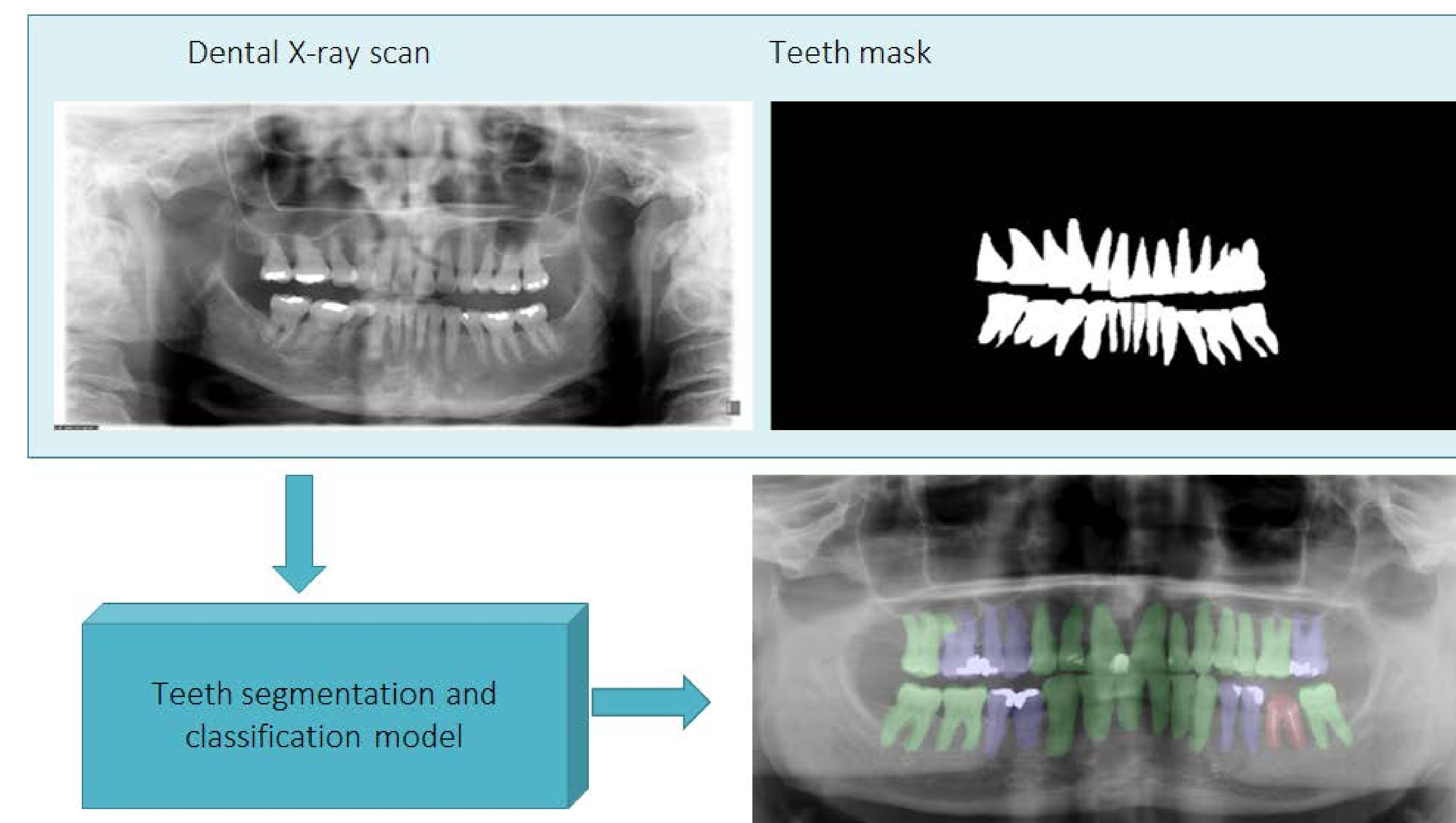
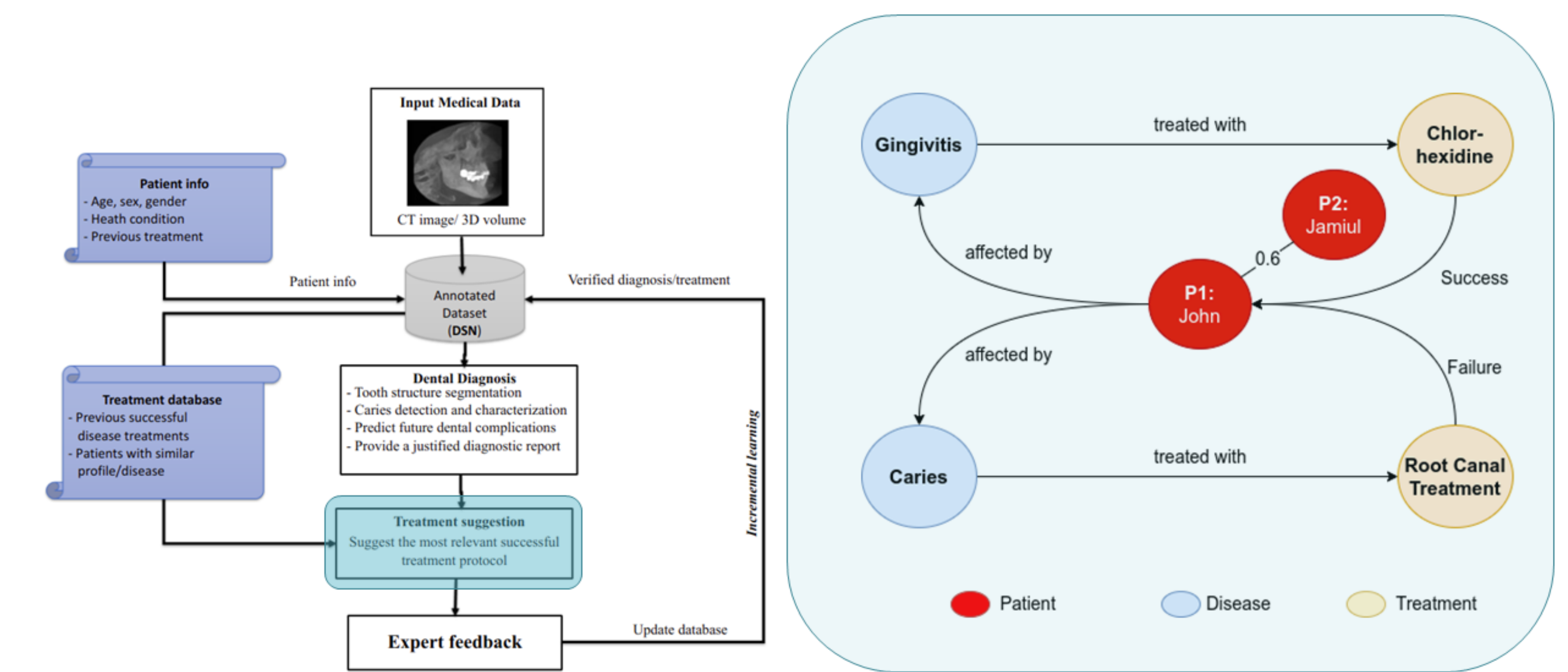
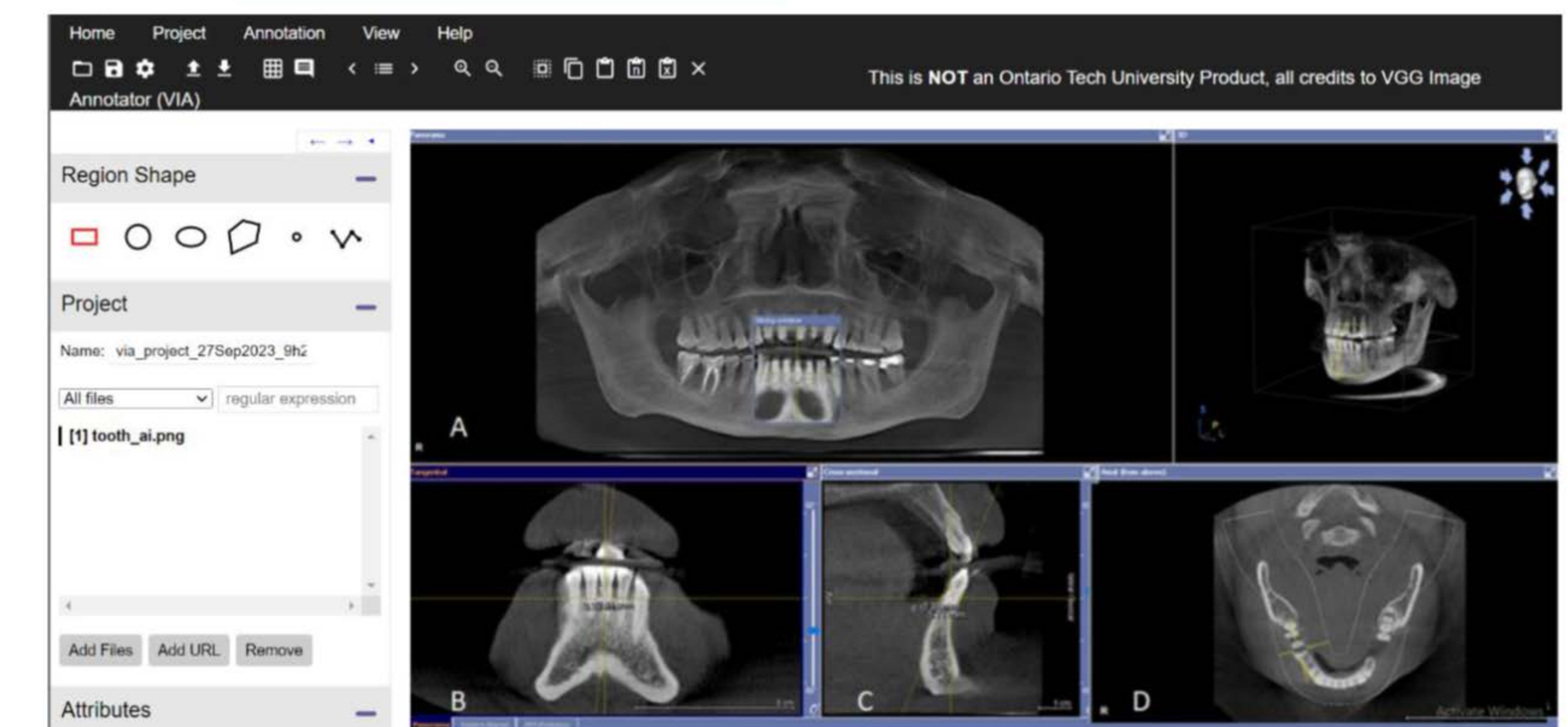
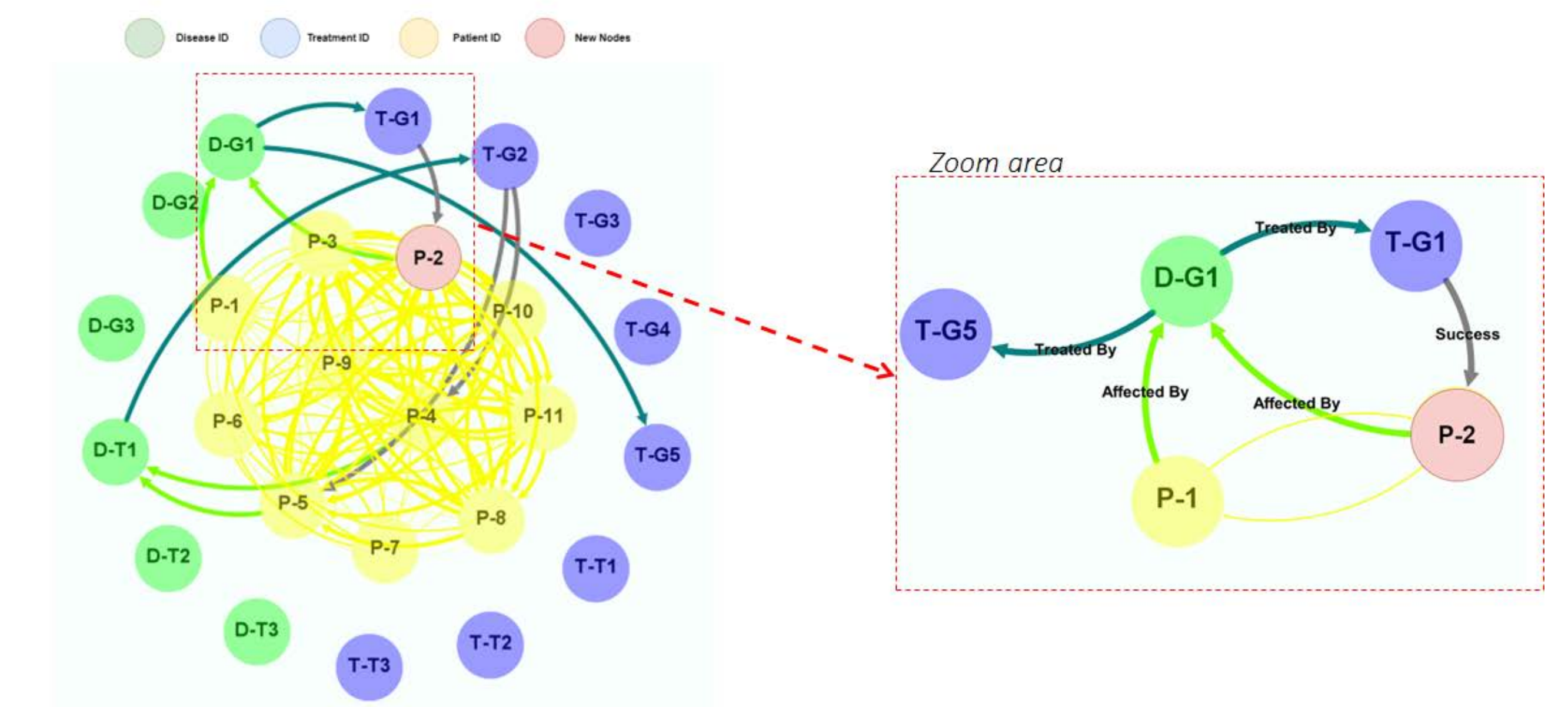


Figure: Example of teeth diagnosis: healthy teeth (green), unhealthy (red), treated (blue).

Dental Semantic Network (DSN)



Dental Semantic Network (DSN)



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Conclusion: Our solution will support municipalities in energy transition with increased hydrogen deployments. Cities and municipalities can develop robust green hydrogen deployment strategies that consider local conditions, mitigate risks, and optimize the utilization of renewable energy resources.