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The 15th International
Heat Transfer Conference

Conference Program

Heat and Mass Transfer
in Computer Animation

Our age is making unprecedented advances not only in the sphere of natural science and engineering, but also in that of animation. **FROZEN**, produced by Walt Disney Animation Studios in 2013, is the latest supreme example. Furthermore, as the title indicates, this marvelous animation intimately deals with heat and mass transfer.

If you are curious about computer animation, be sure to explore "*Moving Innovation: A History of Computer Animation,*" by Tom Sito, a famous pioneer in this field [1]. Basic computer animation technology includes the following tools [2]:
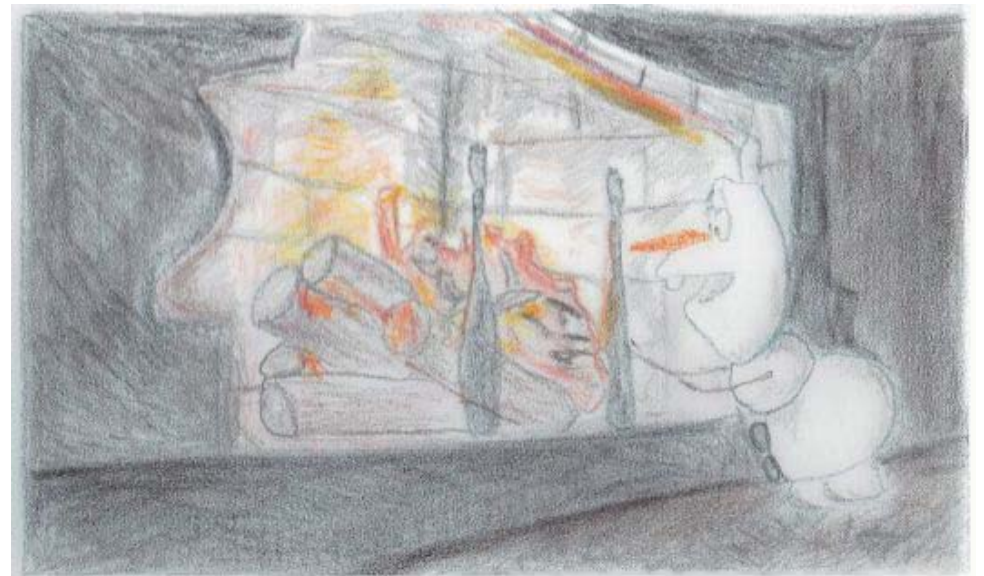* morph target animation,
* motion capture,
* ray tracing,
* rendering,
* wire-frame models.

In **FROZEN**, starting with highly developed implementations of the technologies listed above, "*The studio also developed several new tools to generate realistic and believable shots, particularly the heavy and deep snow and its interactions with the characters [3].*" One of the key papers for snow simulation is freely available from the website of Walt Disney Animation Studios [4].

Although most of us are amateurs at computer animation, there is likely much room for further research concerning the representation of heat and mass transfer.

References
[1] Tom Sito, *Moving Innovation: A History of Computer Animation*, MIT Press, 2013 (http://mitpress.mit.edu/books/moving-innovation)
[2] http://en.wikipedia.org/wiki/Computer_animation
[3] Technology development in FROZEN, http://en.wikipedia.org/wiki/Frozen_(2013_film)
[4] Alexey Stomakhin, Craig Schroeder, Lawrence Chai, Joseph Teran, Andrew Selle, *A material point method for snow simulation*, 2013 http://www.disneyanimation.com/technology/publications

"Wow! So, this is heat. I love it."