

Research Notes

Mohsin Dalvi – DT17MEC050

February 28, 2021

Hello World! [1]

Dual quaternions (DQ), developed by Clifford, consist of a dual scalar and a dual vector as $\underline{p} = \underline{p}_0 + \underline{\vec{p}}$. It is rewritten to give $\underline{p} = p_r + \epsilon p_d$, where $p_r, p_d \in \mathbb{H}$, and represented by an eight parameter tuple $(q_{p0}, q_{p1}, q_{p2}, q_{p3}, q_{d0}, q_{d1}, q_{d2}, q_{d3})$.

$$\underline{p} \underline{q} = p_r q_r + \epsilon(p_r q_d + p_d q_r) = \begin{bmatrix} H(p_r) & \vec{0} \\ H(p_d) & H(p_r) \end{bmatrix} \begin{bmatrix} q_r \\ q_d \end{bmatrix} \quad (1)$$

where,

$$H(p) = \begin{bmatrix} p_0 & -\vec{p}^T \\ \vec{p} & p_0 \mathbf{I} + [\vec{p}]_{\times} \end{bmatrix} \text{ for vector } \vec{p} = (p_1, p_2, p_3), \mathbf{I} = \text{diag}(1, 1, 1) \text{ and } [\vec{p}]_{\times} = \begin{bmatrix} 0 & -p_3 & p_2 \\ p_3 & 0 & -p_1 \\ -p_2 & p_1 & 0 \end{bmatrix}.$$

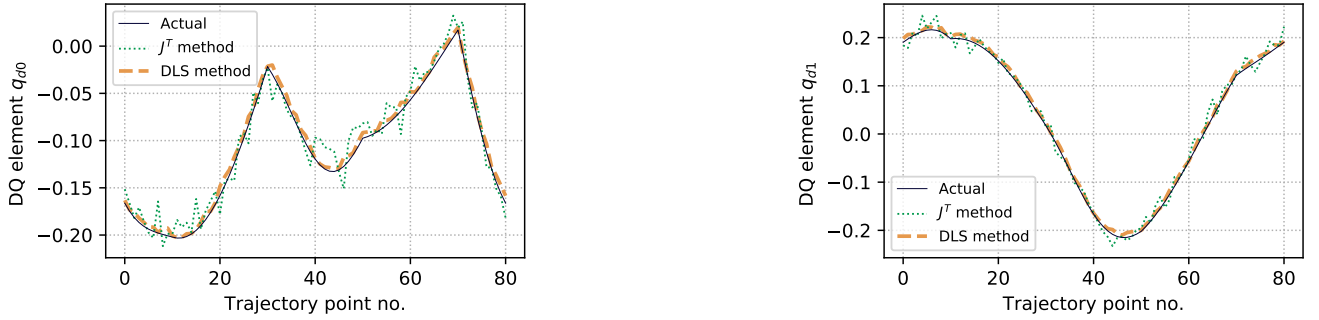


Figure 1: Comparison of DQ elements (q_{d0} and q_{d1}) traced by J^T and DLS IK models [2]

1 Public Speaking – Praveen Wadalkar

Is communication ‘speaking in front public’ or ‘speaking with public’? It is option B. It is not both A and B. There are no option Cs in life. Speaking in front means our focus is on us. But we need to focus on the people. Ironically, at initial stages, it is speaking in front. But as we gain more skill, it becomes speaking with people.

If we fear speaking in public, it won’t be possible to speak. Skill of hammering a nail to a wooden block while standing in a room is same as skill of hammering a nail to a wooden block while standing on a rope. Yet we wouldn’t be able to do this is because of fear. This fear is internal.

Table 1: Frame transformations carried out using [3]

Frame transformation	$\{i-1\}$ to $\{i'\}$	$\{i'\}$ to $\{i\}$
Rotation angle θ	θ_i	α_i
Rotation axis $\hat{\vec{u}}$	$(0, 0, 1)$	$(1, 0, 0)$
Translation direction \vec{t}	$(0, 0, d_i)$	$(a_i, 0, 0)$
$\hat{\vec{u}} \cdot \vec{t}$	d_i	a_i
$\hat{\vec{u}} \times \vec{t}$	0	0
Transformation DQ	$\underline{q}^Z = [C_\theta, 0, 0, S_\theta] + \epsilon [-DS_\theta, 0, 0, DC_\theta]$	$\underline{q}^X = [C_\alpha, S_\alpha, 0, 0] + \epsilon [-AS_\alpha, AC_\alpha, 0, 0]$

A housewife who became blank on her son’s school stage, despite speaking confidently is a Toastmaster’s Club training session, confessed that she was felt the pressure of shattering in her image as a confident woman in her son’s mind. It was an internal fear.

Fear is an emotion. Emotion is a feeling. Feeling is a sensation. A sensation we dont like. It makes our body to react badly. Our breath goes out of control despite we being able to voluntarily control our breathing.

Thoughts and time are 2 factors that can trigger fear. Thought: “what if my son sees me fumble?”. Time: “Last time i froze” or “What will happen if...”. If we are preoccupied with past or future, then our mind is not there in the present. Fear is absence of attention.

Expectation from public is that we convey our message (not convince, motivate or inspire) in a structured, understandable way. For public speaking, we must be there in the moment. Also we must have the skill.

1.1 Four Step System for Public Speaking— 4S

First ‘S’: Snap Judgement

Mark Bowden is a communication and human behaviour expert. He said in TEDx Toronto that it takes just 14–15 seconds for the audience to make a snap judgement whether they like the speaker. It is an evolutionary trait. If we like/hate a person, we like/hate everything about them. See his video.

Techniques to get the audience to like you is ‘Pause and Pan’. Don’t be in a hurry to start speaking. Stage does not give you authority. There is no authority image to uphold. Stage gives you convenience to convey your message.

Take 4-5 seconds pause. Use the convenience of the stage to do 2 things: smile, and pan the audience. If you are in the present, the feeling of being on the stage will ensure that you smile genuinely. People waiting to listen to your message is a celebration, how can our smile be plastic? When there is a smile, it exudes confidence.

Panning means giving deep contact with a random person somewhere near the left, centre and right of audience. Check out youtube video “Toastmasters 2016 world champion ‘Outsmart, Outlast”’ at <https://youtu.be/EjGCetdtknU>.

Audience always behaves as a unit. Everyone in the audience feels personally when even few get praised or insulted. How can i use this dynamics/behaviour in my favour and fulfil my objective of making the audience to like me? People expect you to speak, but you take a pause. You gaze into the eyes of few with a smile. People see you are pleasant, calm and engaging, and they like you.

If you are not feeling awkward, then you are not learning. You feel uncomfortable when you learn until ou gain proficiency (consider how it feels when you drive on day 1 vis-à-vis on day 100). You may have hated trigonometry in school, but had no option to not learn, coz it could affect your career. You have no option to hate when you are learning a new skill.

Second 'S': Start

We see speakers say 'Good Morning' twice or thrice to get louder response. If you introduce yourself again despite host introducing you and audience holding a pamphlet in your hand, then audience is not able to give their attention towards you. You need to catch the attention of the audience. At the start itself, tell people where/how you want to move people from point A to point B. To begin your talk, use three starts:

1. Power of social consciousness: Phrase "There is something common between you and me" to connect with all people in the audience. E.g.: *I believe there is something common between all of us (take a pause). We all believe in manufacturing medicines that are accessible to millions and help in improving their lives....*
2. Power of imagination: Phrase "Imagine for a moment..." makes audience imagine what is point B. Old technique was to use "Am I audible" to get comfortable with audience. Instead, in modern era, use... (Add example from the video recording).
3. Power of stories: Phrase "I remember..." helps to enter into a story. It gives access into my story. E.g.: *I remember we were struggling with business. Then we decided to adopt digital marketing. In last 3 yrs we grew by 200%. Today in the next 45 mins (time attention i want), I will be sharing five digital marketing strategies (how many chunks of content) that can take your business to the next level (what is your benefit).*

Third 'S': Structuring/Storytelling

Albert Mehrabian (Uni. of LA) is a legend in public speaking research. He said that 3 things largely influence how audience reacts favourably during a talk: Content (38%), Body Language (55%) and Vocal Variety (7%).

If body language is not syncing with the content, then audience becomes distracted. Body language syncing cannot be consciously learnt. When you are not afraid and are in the present, you are focussed on the content, and body language automatically syncs. In theatre, the actor gets into other character and learns

When content is relevant, well researched and worth sharing, then there is confidence about content. When you are honest with the content, then there is no fear.

The best speakers say that content delivery is about telling a story. If there is no story, it means there is no experience.

Consider the example of introducing the company: Techizer **get it from the video**

Every story has a structure. 3S method of storytelling:

1. Setup:
2. Struggle: Dont share story if you are still struggling. Struggle attracts struggle. After struggle, there is change, and there is a lesson learned. People with similar struggle connect with you deeply as they also want to change.
3. Success: what you learnt while overcoming the struggle.

Eg: *I remember* (setup)

we were struggling with business (struggle).

Then we decided to adopt digital marketing. (success)

In last 3 yrs we grew by 200% (not a success).

Fourth ‘S’: Structuring/Storytelling

References

- [1] Ramkumar Gandhinathan and Lentin Joseph. *ROS Robotics Projects: Build and control robots powered by the Robot Operating System, Machine Learning, and Virtual Reality*. Packt Publishing, 2 edition, 2019.
- [2] Enrique Fernández, Luis Sánchez Crespo, Anil Mahtani, and Aaron Martinez. *Learning ROS for Robotics Programming: Your one-stop guide to the Robot Operating System*. Packt Publishing, 2 edition, 2015.
- [3] Lentin Joseph. *Learning Robotics Using Python: Design, simulate, program, and prototype an interactive autonomous mobile robot from scratch with the help of Python, ROS, and Open-CV*. Packt Publishing, 2015.