The Carreer and Impact of Ib Madsen

Wolfgang Lück (Bonn)

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Goal: Explain to non-experts in a (convincing and entertaining) way:

- The important and striking mathematical achievements of Ib Madsen;

- His influence on generations of mathematicians;

- His strategy for and approach to solving deep mathematical problems;

- The reaction of the mathematical society to his contributions.

- Emotional aspects.

- What I do not want to do in this presentation addressed to non-experts is to open the following PDF-file and talk about it for an hour or so.

PROPOSITION 4.6. *Let* $g\colon \mathcal{E} \to \mathcal{F}$ *and* $g'\colon \mathcal{E}' \to \mathcal{F}$ *be transport projections and let* $u\colon \mathcal{E} \to \mathcal{E}'$ *be a map of sheaves over* $\mathcal{F}$ *which respects the category structures. Suppose that the maps* $N_0\mathcal{E} \to N_0\mathcal{F}$ *and* $N_0\mathcal{E}' \to N_0\mathcal{F}$ *obtained from* g *and* g' *have the concordance lifting property and that, for each object* a *of* $\mathcal{F}(\star)$, *the restriction* $N_0\mathcal{E}_a \to N_0\mathcal{E}'_a$ *of* u *to the fibers over* a *is a weak equivalence (resp. induces an integral homology equivalence of the representing spaces). Then* $\beta u\colon \beta\mathcal{E} \to \beta\mathcal{E}'$ *is a weak equivalence (resp. induces an integral homology equivalence of the representing spaces).*

Proof. According to Theorem 4.2 it suffices to prove that u induces a homotopy (homology) equivalence from $B|\mathcal{E}|$ to $B|\mathcal{E}'|$. By (4.2) and Lemma B.1 it is then also enough to show that

$$N_k(u)\colon N_k\mathcal{E} \longrightarrow N_k\mathcal{E}'$$

becomes a homotopy equivalence (homology equivalence) after passage to representing spaces, for each $k \geq 0$. We note that the simplicial spaces obtained from a bisimplicial set by realizing in either direction are good in the sense of [39].

Since g and g' are transport projections, an obvious inductive argument shows that, for each k, the diagrams

$$
\begin{array}{ccc}
N_k\mathcal{E} \longrightarrow N_0\mathcal{E} \\
\downarrow{\scriptstyle g} \qquad \downarrow{\scriptstyle g} \\
N_k\mathcal{F} \longrightarrow N_0\mathcal{F}
\end{array}
\qquad , \qquad
\begin{array}{ccc}
N_k\mathcal{E}' \longrightarrow N_0\mathcal{E}' \\
\downarrow{\scriptstyle g'} \qquad \downarrow{\scriptstyle g'} \\
N_k\mathcal{F} \longrightarrow N_0\mathcal{F}
\end{array}
$$

are pullback squares. Passage to representing spaces turns them into homotopy cartesian squares by A.6, since the maps $N_0\mathcal{E} \to N_0\mathcal{F}$ and $N_0\mathcal{E}' \to N_0\mathcal{F}$ have the concordance lifting property. Hence it suffices to consider the case $k = 0$,

$$N_0 u\colon N_0\mathcal{E} \longrightarrow N_0\mathcal{E}'.$$

Again, $N_0\mathcal{E} \to N_0\mathcal{F}$ and $N_0\mathcal{E}' \to N_0\mathcal{F}$ have the concordance lifting property and $N_0 u$ induces a weak equivalence (homology equivalence) of the fibers. By Proposition A.6, the fibers turn into homotopy fibers upon passage to representing spaces. Consequently $N_0 u\colon N_0\mathcal{E} \to N_0\mathcal{E}'$ is a homotopy equivalence (homology equivalence). □

4.2. *Armlets.* We begin by defining sheaves $\mathcal{W}^{al}$ and $h\mathcal{W}^{al}$ on $\mathscr{X}$ with values in partially ordered sets, and natural transformations

- For an expert this is extremely interesting.

- But here we see the dilemma, a non-expert does not have enough background to appreciate this.

- It is like the problem to explain to someone, who does not know English at all, the beauty and importance of the writing of Shakespear.

- Therefore I decided to use a metaphor with something (nearly) everybody knows, understands and likes.

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- How would Ib Madsen's carrier and achievements look like if here were a soccer player.

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- Captain of the Aarhus team since he was 21 years old.

- First game for the Danish national team at the age of 21.

- Captain of the Danish national teams until present since he was 24 years old.

- At the age of 36 he joint the soccer club at Copenhagen.

- Captain of the Aarhus team since he was 21 years old.

- First game for the Danish national team at the age of 21.

- Captain of the Danish national teams until present since he was 24 years old.

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- Current age 42.

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	scores	assist	selfgoals
Superligaen	300	400	0
Danish national team	80	120	0
Champions League	70	100	0

- Participated in several World Championships and European Championships.

- Several times player of the year in Danmark, Europe and in the world.

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- surprising solution
- scorpion
- (de-)loop

- position: Box-to-box midfielder

- Wikipedia:
  The term box-to-box midfielder refers to central midfielders who have good abilities and are skilled at both defending and attacking. These players can therefore track back to their own box to make tackles and block shots and also run to the opponents' box to try to score. A good box-to-box midfielder needs good passing, vision, control, stamina, tackling and marking in defence, and shooting and dribbling in attack.

Skills

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A Typical Performance of Ib Madsen

- Focus on the tackling and the resulting interception of the ball!

- Watch the dribbling!

- See the foul! No complaints by the player, but the player is still focused and carries on!

- Watch the free kick!

- Notice the emotions and the cheer!

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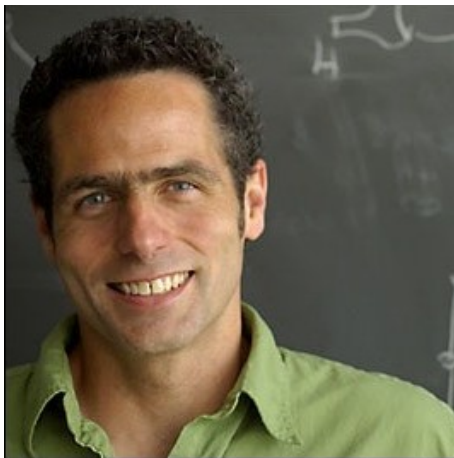
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- Here are some pictures of world class soccer players and coaches, Madsen has played or worked with or of which he is a good friend, and of younger players for which he played an important role in their carrier.

- Comparable with the events documented in the following videos. Listen also to the commentators!

- Ib will have to decide how often he wants to see the last video!