

# Curriculum Vitae Vinzenz Rudolf von Tscharner.

Tele +1 403 949 3714 and +41 81 8500307; Email vincent@kin.ucalgary.ca

## PERSONAL INFORMATION.

Born January 19<sup>th</sup>, 1947 in Berne, Switzerland. Swiss citizen.

Married to Dr. phil. Michaela Aue since 1968.

Languages: German, English and French.

## CURRENT ACTIVITY.

- (a) Adj. Associate Professor, Faculty of Kinesiology, University of Calgary. The current research projects include the development of wavelet based filtering methods for time series such as electromyographic signals recorded from muscles or acceleration signals from body vibrations. Pattern recognition methods are currently adapted to recognize features of movements in human motion and to correlate these features with kinematic data.
- (b) Consultant (Volunteer) for data analysis and data mining for students and post docs in the Human Performance Laboratory
- (c) Self-employed consultant in Biophysics.

## SCIENTIFIC ACTIVITY.

**1978 - 1979 Post Doctorate position at Oxford University (Royal Society), Development of "Condensed - Phase - Radioluminescence" technique.** This method was used to monitor agonist binding to cell receptors.

**Collaboration as consultant to ICI** in Great Britain

**1980 - 1981 Post Doctoral research affiliate at Stanford University,** California, USA Dep. Biochemistry.

**1981 - 1982 Assistant at the Biocenter in Basel,** Switzerland.

**1982 - 1992 Research associate at the Theodor Kocher Institute** in Berne, Switzerland

**1992 - 1997 Self-employed consultant.**

**1997 - 1999 Adj. Assistant Professor, Human Performance Laboratory, Faculty of Kinesiology, University of Calgary.** Project Leader "Electromyographic measurements of muscle activity on radiaesthetically defined sites in comparison to neutral zones" funded by the Swiss National Science Foundation the project was renewed for two more years.

**2000 - 2009 Adj. Associate Professor, Category A Supervisor at the University of Calgary.**

Summary of activities:

New methods for the analysis of electromyographic measurements of muscle activity were developed and applied. These methods include wavelet analysis, pattern recognition, signal processing. The time/frequency analysis using not linearly scaled wavelets became the method of choice in many applications. The wavelet analyzed myoelectric

signals represent a new way for observing the muscle activity of individual muscles and/or of sets of muscles. The method has been expanded and is also used for the analysis of vibrations and mechanomyograms. The intensity patterns that result from the wavelet analysis form an ideal input data format for pattern recognition methods. Various pattern recognition methods have been tested lately including support vector machines. The combination of wavelet analysis and pattern recognition forms a powerful tool for analyzing data resulting from dynamic processes. Some of the processes that have been analyzed include muscle activity patterns resulting from a) walking of patients suffering from osteoarthritis, b) walking pre- and post-ankle replacements, c) running in different shod conditions, d) free style ski jumping and e) patterns resulting from patients suffering from carpal tunnel syndrome. The range of possible applications is large and is currently being explored. The method represents a milestone for the investigation of muscle activation patterns.

#### **EDUCATION:**

**1968 - 1974** Study and final Diploma in applied Physics, Mathematics and Astronomy at the University of Basel, Switzerland.

**Supervisor of practical work of undergraduates.**

**1975 - 1977** **Doctorate in Biophysics** (Ph.D.) at the Biocenter in Basel with Prof. G. Schwarz. Title "Bindungsstudien von Acridinorange an Poly- und Oligoriboadenylysäure." Purification and separation of oligoriboadenylic acid. Theoretical and practical work on cooperative binding of acridin orange to these oligonucleotides.

**Assistant lecturer** to Prof. G. Schwarz. Supervisor for experimental courses in biophysics for graduate students.

#### **PUBLICATIONS**

Total 54 of which 53 were refereed.

Citations 2,637 ( 17 August, 2009, Web of Science® Cited Author=(von Tscharner V\* OR vontscharner V OR Tscharner V) AND Databases=SCI-EXPANDED, SSCI, A&HCI.)

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3. von Tscharner V. Spherical classification of wavelet transformed EMG intensity patterns. J Electromyogr Kinesiol. 2008. doi:10.1016/j.jelekin.2008.07.001

4. von Tscharner V, Nigg BM. Point: spectral properties of the surface EMG can characterize/do not provide information about motor unit recruitment strategies and muscle fiber type. *J Appl Physiol*. 2008 Nov;105(5):1671-3.
5. Croft JL, von Tscharner V, Zernicke RF. Movement variability and muscle activity relative to center of pressure during unipedal stance on solid and compliant surfaces. *Motor Control*. 2008 Oct;12(4):283-95.
6. Travis W. Beck, Vinzenz von Tscharner, Terry J. Housh, Joel T. Cramer, Joseph P. Weir, Moh H. Maleke and Michelle Mielke. Time/frequency events of surface mechanomyographic signals resolved by nonlinearly scaled wavelets. *Biomedical Signal Processing and Control*. 2008 3(3) 255-266.
7. Barandun M, von Tscharner V, Meuli-Simmen C, Bowen V, Valderrabano V. Frequency and conduction velocity analysis of the abductor pollicis brevis muscle during early fatigue. *J Electromyogr Kinesiol*. 2007 Nov 4; [Epub ahead of print]
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9. Valderrabano V, Nigg BM, von Tscharner V, Frank CB, Hintermann B.J. Leonard Goldner Award 2006. Total ankle replacement in ankle osteoarthritis: an analysis of muscle rehabilitation. *Foot Ankle Int*. 2007 Feb; 28(2):281-91.
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13. von Tscharner V, Goepfert B. Estimation of the interplay between groups of fast and slow muscle fibers of the tibialis anterior and gastrocnemius muscle while running. *J Electromyogr Kinesiol* 2006, 16:188-197.
14. von Tscharner V. Goepfert B. Wirz D. Friederich N.F. Analyse der Veraenderungen von Wavelet-transformierten elektromyographischen Signalen, wie sie beim Tragen einer Kniebinde entstehen. *Biomed. Technik* 2004; 49:43-48.
15. von Tscharner V, Goepfert B, Nigg BM. Changes in EMG signals for the muscle tibialis anterior while running barefoot or with shoes resolved by nonlinearly scaled wavelets. *J Biomechanics* 2003, 36:1169-1176.

16. von Tscharner V, Goepfert B. Gender dependent EMGs of runners resolved by time/frequency and principal pattern analysis. *J Electromyogr Kinesiol* 2003; 13:253-272.
17. von Tscharner Vinzenz. Wavelets zur Analyse von Electromyogrammen. *Orthopaedie Schuhtechnik* 2002; 10:42-45.
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- factor: biological equivalence between natural and recombinant neutrophil-activating factor. *Proc Natl Acad Sci U S A*. 1988 Dec;85(23):9199-203.
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